COMPUTER ARCHITECTURE 1

**Block structure of Computers :**

A present day computer has four main components: Input Unit, Memory, Central Processing Unit CPU and Output Unit. A brief description of each of these components is given below

Memory

Input

Output Unit

ALU (arithmetic

And Logic Unit)

(Registers)

Control Unit (CPU)

* **Input Unit:** An input device feeds data and program into the computer. The program contains instruction about what has to be done with data; data can be in the form of text, voice, video, graphic. Some of the popular input devices are:

Keyboard, Mouse, Touch screen, Light Pen, Track Boll Scanner, Digitizer, Joystick, Hard Disk, floppy disk, Punched Card, Microphone, Optical mark Reader.

* Memory: Memory is used as storage of programs as well as data. The Memory can both be Internal External depending upon its location in the Computer System. The Internal memory, also known as main Memory of Primary storage or Random Access Memory (RAM), is directly assessable by the CPU and volatile by nature, whereas the external Memory of secondary storage includes hard disk, magnetic drum etc, are not directly assessable to the CPU and are non-volatile. These devices can be accessed by the CPU through Input/output controllers.
* Central Processing Unit (CPU): Central processing Unit serves as the “brain” of the computer system. The main computer of CPU is CU (Control Unit), ALU (Arithmetic and Logic Unit) and Register.
* Control Unit Manages and co-ordinates the entire computer system. CU, controls the operation of the Input Unit, Output and ALU.
* Arithmetic Logic Unit ALU performs all the arithmetic and logical orations of the data as a result of execution of an instruction i.e. it performs addition, subtraction, division, multiplication comparison etc.
* Registers: Registers are a set of temporary memory location of CPU. Number of Registers is available with each register having specific function. E.g. address register holds address of active memory location, Instruction register: holds and instruction while it is begin executed.
* **Output Unit:** output device provides results to the user of the computer system. Some of the popular output devices are VDU (Visual Display Unit, Printer, Plotter, LCD (Liquid Crystal Display), speaker, Hard Disk, Floppy Disk)

Earliest device that qualified as a digital computer was ‘Abacus’ also known as ‘Sorbian’. It was invented around 600 B.C. and was used for simple addition, subtraction (by appropriate positioning of beads of a lack). All devices that were used for computation before 1940’s were mechanical devices. A popular mechanical calculator capable of performing addition and subtraction was developed in 1642 by French scientist Belasis Pascal. Later. In 1671, his machine was extended to perform also multiplication and division by German scientist Gottfried Leibniz: IN 1823. Charles Babbage. And English mathematician designed a mechanical computing machine for automatic computation of mathematical tables (by the method of finite differences with additions only) and called it “Difference Engine. In 1834 he built a much more powerful mechanical computer known as ‘Analytical Engine’. In which was first programmable machine. Its components were similar to those of a modern computer and had a mechanism for conditional branches of instruction. Charles Babbage is known as the ‘Father of modern computer’.

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In late 1890’s Harman Hollerith came up with the concepts of punches cards (input media). In1896, he formed the Tabulating machine company to manufacture his machines which was renamed as IBM (international Business Machines) in 1924. In 1938, konard Zuse of Germany built mechanical computer Z1 having binary number system. Whereas earlier computer used decimal number system. Later, in 1941, he developed Z3 which was first general- purpose operational program- controlled computer.

Then the first electronic digital computer came into existence name ENIAC (Electronic Numerical Integrator and Calculator). 1943/46, It was developed at the University of Pennsylvania under the guidance of John Archly and prosper Eckert. It used Vacuum Tubes and decimal number system instead of binary. Since its programs were wired on boards and could store and manjoulate only very limited amount of information. So it was difficult to detect errors and to change programs. These problems were later overcome by the development of EDVAC (Electronic Discrete variable Automatic Computer), ‘1946-52’. It used ‘Stored’ program concept, developed by Dr. John Bon Neumann of U.S.A, and also use binary instead of decimal. Almost simultaneously the Briteshers developed EDSAC (Electronic Delay Storage Automatic Calculators), ‘1947-49’ other such the computer that use mean lubes were Manchester mark 1 in ‘1948’ **UNIAC** (Universal Automatic Computer) in ‘1951’

In 1955-65 industries using transistors in place of vacuum tubes to construct computer. Magnetic cores where used for primary storage in 1960 a non- volatile memory was introduced (i.e. even if the power it’s turned off, stored contents are not destroyed). In’1965-75’ computer used IC’s (Integrated), designed and fabricated by jack S. Kitby at text Instruments. SSI (Small Scale Integrated), MIS (Medium Scale Integrated), LSI (Large Scale integrated), and VLSI (Very large Scale Integrated) were made classified of ICs and computer started using ICs as CPU components. After 1975 they microprocessor (IC chip which contains the entire cup of a computer). Now-a-day microprocessors use VLSI chips, and ULSI (Ultra Large Scale Integrated) chips are under construction.

**Generation of computer**

Over the past five decades, computer has gone through five generation of development. Good features of the earlier generations have been passed to the later generations. A description of various computer generations is given below

* **First Generation(1946-1954):**
* Vacuum tubes as CPU components.
* Mercury of delay line, Electrostatic (CRT) for memory.
* Machine or Assembly langrage programming.
* Fixed-point arithmetic was used.
* Magnetic tape/magnetic drum as secondary memory.
* No concepts of operating system.
* Punched card and paper tape to feed program and data to get results.

**Examples:** ENIAC (first electronic, computer completed in 1946), used vacuum tubes as CPU components and memory. Stored program concept in 1946 mend programs and date to be stored in stored in separate memories, Examples EDVAC(1951), UNIVAC(1951), IBM’s701(1953), IBM704(1955), IBM 709.

* **Second Generation(1955 to 1964):**
* Transistor in place of vacuum tubes IN CPU, and other electronic components.
* Magnetic ferrite-core memory as main memory, random-access non-volatile memory.
* Machine independent high level languages like FORTAN, COBOL, and ALGOLE were developed and used as programming languages.
* Floating point arithmetic was used.
* I/O processors were introduced to supervise control input./output operations. They relieved CPU from many time- consuming routine works.
* System Software like compilers subroutines etc was introduced.
* Bach processing was introduced.
* Punched cards continued during this period also.
* Computer was made effect in industry and commercial organization: payroll, inventory control, marketing, production planning, general ledger system and research.

**Example:** IBM 1620 (1960) IBM 7090(1960), IBM 7094 (1962), Digital data Corporation’s (DEC’s) Programmed Data Processor. PDP 1(1957), PDP 5(1963), PDP 8(1965), Control Data Corporation’s (CDC’s) CDC 1604.

* **Third Generation (1965-1974):**
* ICs (SSI and MSI) started replacing transistors in CPU, I/O processors.
* Semiconductor memories (RAM and ROM’s) using LSI technology replaced magnetic core type main memory.
* Certain new techniques such as parallels processing (Multiprocessing) Multiprogramming, Multiuse (time sharing); to increase the effective speed of program execution.
* Cache memory was also introduced.
* Operating systems for multiprogramming and time shared systems (multi-user systems) were developed.
* Computers were widely applicable to multi-user applications, on –line systems reservations, interactive query system, and automatic industrial controls.

**Examples:** CDC 7600(1969), IBM 370 serious (1970), PDP 11(1970, 16-BIT COMPUTER), CDC’s CYBER-175 and STAR-100, Intel’s 4004, 8080.

* **Fourth Generation (1975-pressent):**
* Use microprocessor as CPU. Earlier, Cache, MMU (Memory Management Unit), FPU.  
  Floating point Unit i.e. math processor) were on separate IC’s Now-a-days all such components and CPU are packed into a single IC of the microprocessor.
* Computer network is being-widely used: LAN (local Area Network), MAN (Metropolitan Area network), and WAN (Wide Area Network).
* Multifunction peripheral chips providing functions of interrupt controller, DMA controller, Bus controller memory refresh controller etc on a single IC have developed.
* Disk drives of gigabytes capacity, as secondary memory.
* CE-ROMs, DVD-ROMs have been developed as read only memory for storage.
* Operating system such as WINDOWS-98/Me/XP/NT/2000. Advanced/ Professional. SUN’s Solaris, UNIZ.
* High level languages C, C++ (Object Language), JAVA (Pure Object Language to design web pages), VB (Visual Basic), PROLOG (Programming Logic Language) C#, C-sharp, NET etc.
* Database management: dbase, Sybase, FoxPro, Oracle.
* ES (Expert system) suing AI (Artificial Intelligence).
* Today computer is widely used in industrial control, instrumentation, consumer appliances, banking services, offices, military equipments, education, communications, games, analysis and design, research work and so forth.

**Examples:** Intel’s 8085, 8086, 80286, 80486, Pen rum pr, P-II, P-III, P-VI, Celeron, all by Intel corporation’s LTD. Mortal’s 6809, 68000, 68040, Power PC, Dec’s alpha, MIPS, SUN’s ULTRA SPARC, ADMs, k-6, K-7.

* **Fifth Generation (Yet To come):**
* The fifth generation computer is expected in the year future. Main features of these computers will be as follows:
* Computer will use ULSI (Ultra Large Scale Integration)
* Some important functional chips like Cache controller. Advanced interrupt controller will exist.
* Computer will use extensive parallel processing such as multiprocessor system.
* Natural languages will be used as source languages i.e. programmer will give commands in English or any other languages.
* Intelligent programming will be used where programmer will tell the computer what do to, rather than how to do. Intelligent software will be used for this purpose. Languages like PROLOG will also be widely used.

COMPUTER HARDWARE 2

Computer hardware is the physical part of computer. Including the digital circuitry, as distinguished from the computer software the execute within the hardware. The hardware of a computer is infrequently changed, in comparison with software and data. Which are ‘soft’ in the sense that they readily created, modified or erased on the computer?

Most computer hardware is not seen by normal users. It is in embedded systems in automobiles, microwave ovens, electrocardiograph machines, compact disc players, and other devices.

**TYPES OF COMPUTER HARDWARE**

Basically all computers, regardless of their size, have the same general design which consists of the following units: the central processing unit (CPU), memory, and input/output circuitry which are situated on the **printed circuit board,** also called the **system board** or **motherboard.**

CPU

Input

RAM

Output

Storage

**CENTRAL PROCESSING UNIT (CPU)**

The processor is the workhouse of the system: it is the component that executes a program by performing arithmetic and logical operations on data. It is the one component that creates new information by combining or modifying current information. In a typical system there will be only on processor, known at the central processing unit, or CPU.

CPU serves as the brain of a computer. It executes user’s programs controls memory and input/output devices.

To execute the programs stored in the main memory CPU performs following tasks:

* Fetches instruction from memory.
* Interprets the fetched instruction (about what to be done, what is needed)
* Fetches data, if required either from the memory or an input device.
* Performs arithmetic and logical operations on data.
* Writes result either to memory locations or to an output device.

**The main component of CPU is:**

* **Control Unit (CU)**
* **Arithmetic and Logic Unit (ALU)**
* **Registers.**
* **Control Unit:** Control Unit controls all operation of the CPU. It generate single, which are required for all operations to be performed by the CPU and required for the control of input/output and other devices connected to CPU.
* **ALU:** An ALU performs arithmetic and logic operations. These operations are: addition, subtraction. Division, multiplication, and comparison. In addition to these operations it also takes complements of a number, increments, and decrements of a number, shifting the bits of a number to left of right rotating the bits of a number left or right. Several circuitries are included in the CPU for these above purposes such as: Adder, Counter, Comparators, Encoder, and Decoder.
* **Register:** Register is a set of temporary memory location in the CPU and each register has a specific function. E.g. **MAR** (Memory Address Register): holds the address of active memory locations. **MBR** (Memory Buffer Register): buffer between CPU and memory, holds information on its way to and from memory. PC (Program Counter): holds address of the next instruction to be executed. ACC (Accumulator): holds operands of an instruction to be executed and also holds results after execution. IR (instruction): holds instruction while it is being executed.

ALU

Control Unit

**Internal architecture**

**Internal Clock:** In addition to the above discussed components, CPU also contains an Internal Clock. The purpose of this clock is to generate the electronic pulses that ate used to synchronize the various parts of the CPU and there by ensures the exact timing necessary for their proper operations.

**INPUT/OUTPUT DEVICES**

Input/output (I/O) devices transfer information without altering it between the external world and one or more internal components of the computer. i/o devices can be secondary memories, for example disks and tapes, or devices used to communicate directly with users, such as video displays, keyboards, and mouse.

The communication channels that tie the whole system together can either be simple links that connect two device or more complex switches that interconnect several components and allow any tow of them to.

**Input Device**

Input device serves as a primary means by which user can interact with computer. A wide variety of input devices with an entire range of technologies are available in the market. Some of them:

**Keyboard:** A keyboard is an input device used to type in the market. Some of them: number symbols and other keys such as cursor control keys (to select displayed objects) and function keys (to allow user operations in a single keystroke). When user presses a key, electric signal is generated which enable the computer to determine which key is depressed.

**Mouse:** Mouse is a small hand-held device used to position the screen cursor. Wheel or the roller at the bottom gives instruction to the computer.

**Touch Screen:** Touch screen is a computer screen which responds to the touch of a finger. Usually a number of choices is displayed on the screen as icons. The user touches the icon that represents their choice and the computer display information about that choice. Touch screen sends signal to the computer which gives the location on the screen which has been touched.

**Light Ball:** Light pen is pen shaped device that is used to input to computers by writing or sketching on the screen. It consists of a photosensitive detector that sense light and generates pulse is sent to computer which then identifies the pixel that the pen is painting to.

**Track ball:** Track Ball is an up-side down mouse. A trackball is a ball that can be rotated with fingers or palm of the hand to produce screen cursor movement potentiometers, attached to the ball, measure the amount, and direction of rotation.

**Scanner:** A scanner is an input that transfers information from a piece of paper into a computer. To do this, scanner sends a beam of light to the page and then measures the amount of light reflected back. The amount of light for each portion is given a digital code which is sent to the computer.

**Digitizer:** Digitizer is a popularly used graphic input device. It has a felt surface over which a stylus (like a pencil) is moved. Stylus senses a position through pressure sensitive switch so that the movement of the stylus over the tablet causes a corresponding line the CRT screen. A cursor on the screen corresponds to the currents position of the stylus on the writing suitable.

**Joystick:** Joystick is used to move the cursor or other objects on screen. It is usually used in video games. Joystick is a stick set in two crossed grooves the can be moved freely in left, right, and forward or around the movements are translated into binary instructions with the help of electrical contacts in its base.

**Optical Mark Reader (OMR):** OMR is a device which can detect the presence of a pencil or pen mark on a paper. The presence of mark is confirmed due to lesser light being reflected form that portion of the paper. This technique of mark recognition is possible only when marks are made in pacified portion on the document.

**Magnetic Ink Character Recognition (MICR):** MICR is the process of magnetically reading cheque and deposit slips of the banking industry. It reads the cheque by first magnetizing the magnetic characters already printed on the cheque and then sensing induced by each passing character under a reading head.

**Optical Character Reader (OCR)** : OCR is capable of detecting alphabetic an numeric character printed on paper, OCR device examines each character, compares it with the character (standard font that the machine is programmed to recognize), which ever pattern it matcher is considered to be the character read.

**Bar-Code Reader:** Bar-Code reader is a device used for decoding bar-coded data (in the form of light and dark lines of bars). Bars are decoded as 10 digits; first five of these digits identify a specific product of the manufacture. Bar-codes are use for labeling goods, numbering books in library.

**Punched Card:** Punched card reads the information punched into a card, converting the presence or absence of a hole into an electrical signal representing a binary 0 or 1. As the card is introduced into a punched machine, it passes through a sensing station where photoelectric cells detect the presence of absence of holes.

**Output Device**

An output device provides final results of computation in the form that is clearly understand by human beings i.e. character, graphical, audio or visual. Some of the common output devices are:

**Visual Display Unit:** The primary output device is visual display unit or video monitor, Operation of video monitor is based on the standard cathode-ray tube (CRT) design, where beam of electrons are passed through electro-magnetic fields and is directed to phosphorous coated screen. A device that produces an image line by line is called a Raster Scan display device and a device in which CRT has the election gun directed only to the parts of screen where a picture is to be drawn I Random Scan device. For a monochrome CRT single electron gun is used while for a color CRT three electron guns are used.

**Liquid Crystal Display (LCD)**: LCD is used in smaller, portable devices such as calculators, laptop computer, LCD produces a picture by passing polarized light form the surroundings or from an internal light source through a liquid- crystal material that can be aligned to either block or transmit the light.

**Plotter**: plotter is an output device that is used to produce good quality drawing and graphs. These are two types of plotter:

**Flat Bad Potter:** In this, paper is fixed on a stationary horizontal plotting surface on which the images are drawn, and is capable of horizontal, and is capable of horizontal, vertical, leftward, and rightward motion.

**Drum plotter:** In this, paper is mounted on a rotating surface, capable of clockwise or ant clockwise movement. The mage is drawn with a pen, capable of liner movement.

**Printer:** Printer is an output device that produces hard copy of the document. Printers are classified an Impact and Non-Impact Printers. Impact printer has mechanical contact (hammering a typeface against paper and inked ribbon) between the print- head and paper. Non-impact printer has no mechanical contact between the print head and paper. Such printer user thermal, chemical, electrostatic, laser technologies.

**Impact Printer:** Impact printers are further classified as:

**Line Printers:** Prints a complete line-at-time. Printing speed varies from 150 line to 2500 lines per minute with 90 to 100 character on 15 inch line-it may be further of two types:

**Drum Printer:** Consist of a cylindrical drum on which characters are embossed, one complete set of characters in embossed for each and every point position on a line. This drum continuously revolves in front of the print line, one revolution of is required to print each line.

**Chain Printer:** Consists of a steel band on which characters are embossed. As the band rotates, the print hammers strike the paper, along with the linked, against the proper character on the band as it passes. The character set is repeated several times on the chain, so it is not necessary to wait for the chain to make a complete revolution to position the desired character in the correct print position.

**Character Printer:** Printer one character-at-time, with the print head moving across a line also known as serial printer. It normally prints 30 to 300 characters per second- it may be further of tow types:

**Dot Matrix Printer (DMP):** This type of printer creates form a set of dots. The print head contains a vertical array of prints. As the head moves across the paper, selected pins fine against an inked ribbon to form a pattern of dots on the paper. The capital letters are formed using 5\*7 matrixes of dots, though there are 9 pins on the print head. The bottom 2 pins are used form the small letters like. f,g,I,p,q,y,etc. graphics as well as character set any languages (than English) use 24 pins in the head.

**Letter Quality Printer:** Prints full character (continuous instead of dots). The most popular printer of this type is Daisy-Wheel Printer. It prints solid-font type character and has speed up to 90 characters per second.

**Non-impact printer:** These can primarily be categorized as follows:

**Electromagnetic Printer:** By using magnetic recording technique, a magnetic image of what is to by printed can be written on a drum surface. Then this surface is a passed through magnetic powder which adheres to charged areas. The powder is then pressed onto the paper.

**Thermal Printer:** This printer uses heat to print character on heat sensitive paper. The printer head contain needles upon application of heat to sleeted pins the paper changes color to from a pattern of dots. It is comparatively quieter than the dot matrix printer bits require special heat sensitive papered to work with.

**Electrostatic Printer:** Paper is waited with a non-conducting dielectric material which holds charges when voltages are applied with writing heads through a toner which contains materials with colored particles carrying on opposite charge to the written by eh heads: as a result particles adhere to the magnetized areas, formatting printed character.

**Inkjet Printer:** An inkjet printer uses sprays of ink to form characters on a page bubble jet printer is a inkjet printer that sends dumps of bubbles on ink in each jet.

**Laser Printer:** Laser printer is a very speed non-impact printer and also called page printer i.e. can produce page of output at a rate equal to a paper copier. Each page produced on such printer is original on since there is no carbon copies. This printer uses laser or other light source to print characters on the page. The laser puts an electric charge onto a rotating drum where the desired output image is written. The dry ink or toner sticks to the drum where it has been charged and permanently gets deposited on to the paper with pressure.

**Computer memory**

Memory is a passive component that simply stores information until it is requested by another part of the system. During normal operations it feeds instructions and data to the processor, and at other times it is the source or destination of data transferred by I/O devices. Information in a memory is accessed by its address. In the memory might be send the instruction at location M (1000) or disk controller’s request might be store the following block of data in location M (0) through M (255).

A computer uses a number of memory devices of different technologies such **Semiconductor Memory, Magnetic Memory,** and **Optical Memory.** Here is a brief discussion of these memories one be one.

**Semiconductor Memory**

There are two main types of semiconductor memory: **RAM** (Random Access Memory and **RAM) (read only memory**).

**RAM:**

RAM stands for Random Access Memory i.e. any memory location can be accessed in a random way, access time is same for each and every location. Its access time is 7-15ns (nano seconds). 64-128 MB (mega Bytes) RAM is commonly sued. RAM is a read/write memory, since information can be written into or read from RAM. RAM is a volatile memory. It stores information as long a s power is supplied to it. Its contents are lost when power supply is switched off. There user to reload his programs and data when power supply is resumed.

There are two types of RAM; Static **RAM (SRAM)** and Dynamic RAAM (DRAM). A SRAM retains the stored information is long as power supply in on. But a DRAM loses its stored information in few milliseconds even though its power supply is on as it stores information in the form the charge in capacitor. Which leaks away in a short time? Contents of DRAM are required to be refreshed periodically by restoring the capacitor charge to its full value.

**ROM :**

STANDS FOR Read only Memory. ROM is anon-volatile memory. it stores information permanently, contents are not lost when its power supply is switched off. ROM access line is 20-80 is and storage is 16 KB (kilo Bytes) to 1 MB. ROM is not accessible to user, and hence user can’t write anything into it. ROM is used to store permanent (fixed) programs such bootstrap to loader of a compute. RAOM contents are written at the time of its IC fabrication several types of ROM are available in market.

Prom (programmable ROM): A PROM is a programmable ROM. The user cans writer a program or data into a PROM. PROM’s are only once programmable in the user can write his program data into a PROM only once.

**EPROM**: An EPROM is an erasable PROM. Its contents can be erased and it can be reprogrammed more than one. The ultraviolet light is used for erasing option of EPROM. EPROM holds those data/programs which are permanent but need in data EPRON are far more economical than PROM because they can be reused.

**E2PROM OR EEPROM:-** refers to Electrically Erasable PROM. Also refers to EAROM (electrically Alterable ROM).EEROM contents can be erased and programmed every easily on byte by byte basis i.e. selective erasure of its contents is possible. But EERPOM requires different voltages for erasing writing and reading the store information and has high cost, lower reliability.

**Magnetic Memory**

The magnetic memory is a permanents memory; it is not volatile and is used as a secondary/ back-up memory. The following types of magnetic memory are used:

**Hard Disk :**

Hard disk is used secondary memory for mass storage of information permanently. It is made of aluminum base with a thin coating of magnetic material (iron-oxide) over it. Standard hard disk sizes are: 5025, 3.5 and 2.5 inch diameter. 2.5 inch disk be used in portable computer, 3.5 inch disk is commonly used; 2.25 inch disk was used earlier. Hard disk stores digital information on the magnetic coating and then can access that information through read/write head. Hard disk is a surface device. Its surface is divided into a number of concentric tracks. And each track is dividing into and number of sector. Hard disk can access data at 5 to 13 (milliseconds) and has storage of 80 GB (Gig Bytes). To increase storage capacity, several hard disks, called platters, are mounted on a common drive to form a disk pack.

**Floppy Disk:**

A floppy disk in made of thin plastic material (Mylar) with a costing of magnetic material such as iron-oxide barium-ferret. The disk is not a hard plate, rather every thin flexible plastic and hence is called ‘floppy’ disk. Floppy disk is also known as diskette and is used as a secondary/backup memory. Users can also store their programs and important information in it. Different sizes of floppies are: 5.25 inch and 3.5 inch diameter storage capacity is too small as compared to hard disk: 5.25 inch floppy has 1.2 MB capacity and 3.5 inch floppy ass 1.44 MB capacity. Floppy disk also is surface device: it is divided in concentric tracks, and each track is divided into sectors. The write protected notch of floppy helps to protect the stored information.

**Magnetic Tape:**

Magnetic tape is low-cost, mass storage device consisting of for nothing plastic strip coated with iron-oxide. Magnetic tape is used for backup is servers, work station, and large computers. A file or particular information stored on a magnetic tape cannot be accessed directive on random basis as it done in case of a hard disk. It is a serial access storage device. The size of magnetic tape is ½ inch ¼ inch, 8mm and 3mm Reading or writing is performed by a helical scan system operation across the tape, similar to the a audio/video cassette tape drives. The data on the tape as organized in the form of records separated by gaps. A gaps between the two consecutive records is called inter-block gap (IBG)

**OPTICAL DISK**

Laser beam is used to write information to or information form on optical disk. Optical disk is relatively inexpensive has high storage capacity and has a long life. The read/write head does not touch the disk surface several millimeters away from the disk surface. Hence no disk wear and no problem of head crash. The disk is removable from the computer hard disks is detachable to the computer system. Its access speed is 80-300mm and storage is 150mb-17Gb. Types of optical disk are: CD-ROM. WORM, DVR-ROM, DVE-R, and DVD-RAM.

**CD-ROM**

It is compact Disk only Memory Manufacture writes information on CD-ROMs. The disk is made of polycarbonate and rotated with highly reflective surface such as aluminum. The disk size is 5.25 inch laser beam. A typical value of track density is 16000 tracks per inch, very high as compared to track density of hard disk. CE-ROM doesn’t use concentric tracks, rather uses single spiral tracks. The data in CD-ROM platters isolated from the outside world by a storing protective layer of plastic. So when laser is focused on the disk to read data. It is not reading the very top surface of the disk where small scratches and dirt reside.

**Worm**

It is writing once Read only optical disk. The user can write date on WORM only once, as is done in case of semiconductor PROM. The written date can be read as many times as desired. The size of the disk is 5.25 inch diameter and capacity 650 MB. Its tracks are concentric circle and has longer access time compared to hand disk.

**DVD-ROM (Digital versatile Disk-Rom), DVD and DVD-ROM**

DVD-ROM is an optical ROM, it stores much more data as compared to CD-ROM, a typical value is 4.7GB. Disk with dual lager, double sided have also been designed. Spirals in DVD are more tightly coiled in. it contains a think polycarbonate plastic which provides a base for other layers. The next layer is a thin opaque layer of reflective material, and then comes a thin layer of transparent film. Finally a protective layer is provided. DVD-R is once whitebait optical disk. It is recordable DVD, similar to WROM; DVD-ROM IS A READ/WRITE OPTICAL MEMORY.

**More about Memory**

**Cache Memory**

The cache memory is placed between CPU and the main memory. it is a high speed memory and holds currently needed instruction and data to the CPU. Access time of cache is 2-6 ns and storage is 256-512 KB.

**Technique of accessing the cache:** CPU sends as address to cache. Cache compares this address to the address present in it. If the address matches, ‘hit occurs’, corresponding data is read by CUP. If address doesn’t match, ‘miss’ occurs; the data is to be read form main memory. The data read from main memory is also then written to cache so that when this specific address is accused next time, hit will occur.

**Written schemes of cache:** Write-through and write-Back. In a write-through scheme, the main memory is updated each time the CPU writes into the cache, so that main memory contains same data as in the cache. In a write-back scheme only the catch memory is updated during a write operation. The updated location in cache is marked by a flag so that later when word is improved from cache, it is copied into main memory. This scheme is preferred over previous scheme since the exchange between cache and main memory are fewer and better timed.

* **Real and Virtual memory**

The main memory actually available in a computer system is called real or physical memory. The team virtual memory refers to something which appears to be present but actually it is not. The virtual memory technique allows users to use more memory for a program than the real memory of a computer.

The program is stored in the secondary memory. The part of program that is currently needed is transferred from the secondary memory to the main memory for execution. After execution this part is sent back to the secondary memory. Therefore, the CPU takes another part of the program for execution. Thus the main memory always keeps only the currently needed part of the program. This ‘to and fro’ movement of instruction and data (parts of a program) between the main memory and the secondary memory is called swapping. Thus a program requiring more memory space than the capacity of the main memory can be executed using swapping technique. This concept is known as virtual memory technique and the memory space needed by the program is virtual memory.

**Back-up Devices**

A backup is a file. Or collection of files, that has been copied. A file that has been accidentally deleted can be brought beck, or retrieved, from a backup. Back up also helps if a file is corrupted. The backup is usually stored on a floppy disk, hard disk, magnetic tape, or optical such as CD.

COMPUTER SOFTWARE 3

Software, consist of programs. It enables a computer to perform specific tasks, as opposed to its physical components (hardware) which can only do the tasks they are mechanically designed for. The term include application software such as word processors which perform productive tasks for users, system software such as operating, which interface with hardware to run the necessary services for user-interfaces and application, and middleware which controls and co-ordinates distributed systems.

**TYPES OF COMPOUTER SOFTWARE**

Practical computer systems divide software divide software into three major classes: system software, program software and application software, although the destination is arbitrary, and often blurred.

**System software:** helps run the hardware and computer system. In includes operating system device, diagnostic tools, servers, windowing system acuities and more. The purpose of systems software is to insulate the applications programmers much as possible from the details of the particular computer complex being used, especially memory other hardware features, and such accessory devices as communications, printers, readers displayed, keyboard.

**Programming software:** usually provides to be assisting a programmer in writing computer programmer and software using different programming languages in more convenient way. The tools include text editors, compilers, and interpreter’s linker laborer and so on. An integrated development environment (IDE) mergers those tools into a software and, programmer may not need to type multiple commands for compiling, interpreted bugging, tracing, and etc. because the IDE usually has an advanced graphical user interface.

**Application software:** allows end users accomplish one or more specific (non-computer related) tasks. Typical application incite must be automation, business software, education software, medical software, databases and computer games. Business are probable the biggest users of application software, but almost the fields human activity now user some form of application software, it to automate all sop of.

**COMPUTER LANGUAGE**

**PROGRAMMIN LANGUAGES:** A language that is used for expressing a set of computer instructions (program) programming languages.

Two major categories of programming language are low level and high level Languages. Low level languages can be further divided into machine language and assembly written are machine independent i.e. a program written in such a languages can usually run on computer of different types, sizes and manufactures. Programming languages such as C, FORTRAN, or Pascal that enables a programmer to write programs that are more or less independent of a particular type of computer. Such languages and further form machine languages. In contrast assembly closest to the hardware of the computer and interacts with it directly.

FPRTAR

C

High Level language

**Assembly Language**

**Machine Language**

**Hardware**

Pascal

* **First generation**

During the 1950’s the first computer ware programmed by changing the wires and set tens of dials and switches. One for every bit sometimes these settings could be stored on paper tapes that looked like a ticker tape form the telegraph-a punch card. With these tapes and or cards the machine was told what, how and when to do Something. This generation includes **Machine Language**

An instruction written in machine language is simply a string of binary digits (0s and 1’s) and therefore in incomprehensible and very difficult to work with

* **Second Generation**

Because the first generation “languages” were regarded as very use unfriendly people set out look for something else, faster and easier to understand. The result was the birth of the second generation languages (2 to the mid the 1950’s) these generation made use of symbols and are called **Assembly language.**

**Assembly language:**

An assembly language uses symbol codes instead of binary numbers. In fact, each instruction of the assembly language contains a symbol mnemonic code (mnemonic code) that determines an operation to be performed and a symbolic address to the computer from where the data can be read or stored into. For example, the computation (X=X+Y) would be expressed in an assembly languages of a computer as:

* **Load x (load x into accumulator)**
* **ADD y (Add y to the accumulator)**
* **STORE z (Store the result)**

The major different between the languages and its corresponding assembly languages lies of other manner in which both refer to memory stations. The assembly language and the machine language work with symbolic and absolute memory address respectively. In fact, there is non-to-one correspondence between these two in the sense that for copy library code or machine language.

The machine language of one type of machines is altogether different from the machine language of other types of machine.

From example, the machine language program. An assembler does this job for the programmer. It converts(or assembles) the symbolic program. Into its equivalent machine program and also gives appropriates error massages needed for the program development.

* **Third Generation**

At the end of the 1950’s the ‘natural language’ interpreters and compilers were made. But it sometime before the new language was accepted by enterprise. About the oldest 3GI is **FORTRAN (**Formula translation**)** which was developed around 1953 by IBM this is a language primarily intended for technical and scientific purposes. Standardization of FORTRAN started 10 years later, and a recommendation was finally published by international standardizing (ISO) in 1968 COBOL (COMMON BUSINES ORIENTED LANGUAGES) was developed around 1959 and is like its mane says primarily used, up till now in the business world. With a 3GL. There was no longer a need to work in symbolic. Instead a programmer could use a programming language what resembled more to natural language. Be it a stripped version with some two or three hundred ‘reserved’ words. This is the period (1970) were the now well known so called ‘high level’ languages like BASIC, PASCAL, ALGOL, FORTRAN, PL/L and C have been born.

* **Fourth Generation**

A 4GL is an aid which the end user or programmer can use to build an application without using a third generation programming language. Therefore knowledge if a programming language is strictly spoken needed. The primary feature is that you do not indicate HOW a computer must a task but WHAT it must do in other words the assignments can be given on a higher functional level. A few instructions in a 4GL will be the same as hundreds of instruction in a lower functional language li9ke COBOL or BASIC. Application of 4GL’s are concentrating on the daily performed is such like screen forms, requests for data, change data. Making hard copies. In most of these cases deals with Data Base Management system (DBMS). The main advantage of this kind of languages that can create an application in a much shorter time for development and debugging them would be possible with older generation programming language. Also a customer can be involved in the project and can actively take part in the development of a system; by means of simulation run long before the application is actually finished.

The disadvantage of a 4GL lays more in technological capacities of hardware. Since programs written in the 4GL are quite a bit larger they are needing more disk space and demanding a larger part of the computer’s memory capacity than 5GL. However in most cases the 4GL environment is often misused as a documentation tool and control implement. In very few cases the use of such program are increasing productivity. In most cased they only are used to lay the basis for information systems. And programmers use all kinds of libraries and toolkits to give product its final form.

* **Fourth Generation**

The evolution of programming languages and software development tools has not ended with the 4th Generation. It has been suggested that object-oriented programming represents a new generation of tools. Object-oriented development is based on the use of ‘objects’ that represent both the data structures and the processes that can act on the data. A major strength of such objects is that once they are defined they can be used over and over and over again, thus reducing the effort needed to develop systems. Later generations of program development tolls may less and like language in the tradition sense of instructions written in text must conform to a specific grammar or syntax. Many attempts are made but are stranding on the limitations of hardware, and strangely enough on the views and insight of the use of natural language. This term is often misused by software companies that build programming environments. Till today one can only see vague contours. When one sees a nice graphical interface it is temptation to call that a fifth generations.

**OPERATING SYSTEMS :**

The operating system is the core software component of your computer. It performs many functions and is, in very basic terms, an interface between your computer and the outside world. The operating system provides an interface to different parts of computer like monitors, keyboard, mouse etc, using what is referred to a as **drivers.** This is why sometimes when you install a new printer or other piece of hardware, your system will ask you to install more software called a driver.

A driver is a specially written program which understands the operation of the device it interfaces to. Such as a printer, video card, sound card or CD ROM drive. It translates commands from the operating system of user into command understood by the component computer part it interfaces with. It also translates response from the component computer part back to responses that can be understood by the operating system, application program or user

**History of Operating System**

The earliest electronic digital computers had to operating systems. Machines of the time were so primitive that programs were often entered one bit at on rows of mechanical switches (plug boards). Programming language was unknown (not even language). Operating systems were unheard of. By the early 1950’s the routs had improved somewhat the introduction of punch cards. The General Motors Research Laboratories the first operating systems in early 1950’s for their IBM 701. The system of the 50’s generally ran on job at a time. These were called single-stream batch processing systems because programs and data were submitted in groups or batches. Batch of jobs were made in advance, store them on magnetic Tape and then execute them in one continuous sequence. There result was placed on another magnetic tape. They system of the 1960’s were also batch processing systems, but they were able to take better advantage of the computer’s resources by rerunning several jobs at once. So operating systems designers developed the concept of **multiprogramming** in which several jobs are main memory at once; a processor is switched from to job as needed to keep several jobs advancing while keeping the peripheral devices in use in multiprogramming the operating system loads number of independent programs from the disk to the main memory. CPU begins execution of one program and executes its instruction until it needs some input/output operation or disk read/write operations. Since CPU is much faster as compared to memory or O/I device. So to utilize its high-speed capability. It should be kept always busy in executing programs. Thus, when first programs are suspended, another program is taken up. When they require I/O operations etc, are completed the CPU then suspended the seconds program and resumes the first program, which was suspended earlier. Hence CUP doesn’t waste its time in waiting when slow I/O devices are completing their operations. So multiprogramming technique keeps CUP and or more I/O devices busy by overlapping CPU and I/O operations and hence increases overall efficiency of the computer system. On the system with on multiprogramming. When the current job paused to write for other O/I operation to complete. The CPU simply sat idle until the I/O finished. In multiprogramming memory is partition into several pieces, with a different job in each partition. Another major feature that evolved was the technique called spooling (**simultaneous peripheral operation online**). In spooling, a high-speed device like a disk interposed between a running program and a low-speed device involved with the program in input/ output. Instead of writing directly to a printer. For example, output is written to the disk. Programs can run to completion faster and other programs can be initiated sooner when the printer becomes available, The outputs may be printed. Note that spooling technique is much like thread being spun to a spool so that it may later is unwound as needed. Another feature present was **time-sharing** technique of Multiprogramming technique, in which each user has and on-line (i.e. directly connected) Timesharing system were developed to multiprogramming large number of simultaneous interface user. They are therefore also called multi-user system. The processor is sliced in small slices of time, 20millisecond and one time slice is given to each user at the completion of which processor is allocated to the next user. In this way it goes to all users and gives 20 millisecond times to each user in turn. Then to the first user. It repeats the same process again and again. Since the computer works at very high-speed the user feels that the computer is exclusively attending him and his program. The drawback of this of work that work of all users are halted when the computer is halted, which is not there if each on has dedicated process. **Functions of Operating system:** Even though, not all system has the structure, a general Operating system performs the following functions:

* **Process Management:**

The operating system manages many kinds of activities ranging from user programs system program like printer spooler, name server, file server etc. each of their activities is encapsulated in a process. A process includes the complete execution context (code, data, PC, registers OS resources in are etc.

**Main-Memory Management:** Primary-Memory or main- memory is a large array of words or bytes with each word or byte having its own address. Main-memory storage that can be access directly the CPU.

**File Management:** A file is a collected of related information defined by itscreator. Computer can store files on the disk (secondary storage), which provide long term storage. Some examples of storage media capacity, data transfer and access methods.

**I/O System Management:** I/O subsystem hides the peculiarities of specific hardware devices form the user. Only device knows the peculiarities of the specific device to which it is assigned.

**Secondary-Storage Management:** The computer system must provide secondary storage to back up main memory (as it is volatile in nature). Secondary storage consists of tapes, disks, and other media designed to hold information that will eventually be accessed in primary storage (primary, secondary, cache) is ordinarily divided into bytes or words consisting of affixed number of bytes. Each location in storage has an address; the set all address available to a program is called an address space. Their three major activities of an operating system in regard to secondary storage management are: managing the free available on the secondary device, allocation of storage space when new files have to be written and scheduling the requests for memory access.

**Networking:** A distributed system is a collection of processors that do not share memory, peripheral devices, or a clock. The processors communicate with one another through communication lines called network. The communication network design must consider routing and connection strategies, and the problems of contention security.

**Protection System:** If a computer system has multiple Users and allows the concurrent execution of multiple processes, then the various processes must be protected on another activities. Protection refers to mechanism for controlling the access of program processes, of users to the resources defined by a computer system.

**Command interpreter System:** A command interpreter is an interface of the operating system with the user. A user gives commands with the executed by operation system (suing by using them not calls). The main functions of a command interpreter is to get and execute the next user specified command, commanded-Interpreter is usually not part of the kernel, since multiple command interpreted (shell, in UNIX terminology) may be support by an operating system, and they do not really need to run in kernel mode, there are two advantage to separating the command interpreter form the kernel.

**TRANSLOTORS**

Translators in not fixed terminology used in computer. I am using it to represent both compiler interpreters collectively. The only thing that a computer can run is machine code. Each different processor has different machine code that they can run (or understand). This means that for a user to run program that they have written, the program must be translated into machine code of the computer on which the user is running it. There are two basic ways of translating your program (in whatever language it was written) into machine code. One is to do so ahead of time and then feed the entire machine come to the computer at once. The other is to translate the program form whatever language is being used to machine code as the machine is running it. The method is called interpreting and is most often associates with Basic.

**Compilers**

When you run compiler, it translates your program form the language it was written in, into machine code this machine-code is (usually) written out to a file (in DOS parlance, it’s with extension. exe). When you run the program, the computer executes the machine code instruction form.exe file in sequence. The advantages in compiling are that because the code in already in machine code form, it runs very quick. No translation is required while the program can often be quite small. The disadvantages ate that compiling a program van is somewhat lengthy, since the entire program must be complied, Also, the original program in no long connected to the machine code, an mapping the machine code to the original program can be very difficult (making writing a debugger difficult indeed). Also, from a developer perspective, each processor points a different machine code and thus requires a completely different compiler. An example of this is that run-time errors in a compiled program are usually general and often do indicate where the error occurred. This is because things like line number information are lost during compilation.

**Interpreters**

In interpreters converts each line of program into machine language as the statement is encountered multiple times (as occurs in a loop) the machine must convert it to machine language each time. However, as you can imagine, translating the same //////////// code into machine code and then executing /////////// machine code has quite a high Overhead. Thus interpreters usually run much more slowly than a compiled Program. However, because, the original programs still being world. On, debuggers are easier the write and separate executable file need to be stored. Converting the program a machine language however, can take several minutes (although more red ///// compilers are faster). Compiler run-time error messages are usually very general and rarely point out the line on which an error occurs. This is because most of this information has been lost in the translation form program to machine language.

**Turing**

Turing is a pseudo-compiler. A pseudo-computer is technology half way between a pure interpreter and a ////////// compiler. When you run a program in Turing translates the program not into machine code, but into what called pseudo code. Pseudo codes ///////////// a sort of generic machine code. It is not specific to any processor but it follows the generation of what most machine-code look like. Because it is a generation language, translation from Turing to pseudo code is very quick. In general, completive time is measured ////////// an interpreter.

APPENDIX 4

**COMMUNCATION BETWEEN PROCESSOR AND INPUT- OUTPUT DEVIES**

Communication between the processor and I/O devices can be handled in a variety of modes. Some modes us the processor as an intermediate path, others transfers the data directly to And from the memory unit. There is possible modes are given below:

* Programmed I/O
* Interrupt-Initiated
* I/O DMA (Directly Memory Access)

**Programmed I/O**

The simplest strategy for handing communication between the CPU and an I/O module is programmed I/O. using this strategy, the CPU is responsible for all communication with the I/O modules, by execution instruction which control the attached devise. For example, if CPU wants to send data to a device using programmed I/O it would first issue an instruction to the appropriate I/O module to tell it to expect data. The CPU must then wait until the module responds before sending the data. If the module is slower than the CPU may also has to wait until the transfer is completed. This can be very inefficient. Another problem exists if the CPU has to read date from an I/O device such as keyboard. CPU issues and instruction to the appropriate I/O module to see if any keys have been pressed. This is also extremely inefficient.

**Interrupt Drive I/O:s**

A more common strategy is to use interrupt driven I/O. this storage allows the CPU to carry on with the other operation until the module is ready to transfer data. When the CPU wants communicate with a device, i.e. issues an instruction to the appropriate I/O module, and then continues with other operations. When the device is ready, it will interrupt the CPU the continuously poll input device to see if it must read any data. When an input device has data, then the appropriate I/O module can interrupt the CPU to request a data transfer. Although interrupt driven I/O is much more efficient than program controlled I/O, all data is still transferred through the CPU. This will be inefficient if large quantities of data are being are transferred between the I/O and memory. The transfer will be s/////// than necessary, and the CPU will be unable to perform any other action while transferring of data is taking place.

**Direct Memory Access (DNA)**

Many systems use an additional strategy, known as direct access memory. DMA uses an additional piece of hardware- a DMA controller, the DMA controller can take over the system bus and transfers data between an I/O module and main memory without the intervention of The CPU. Whenever the CPU wants to transfer the data, module, and main controller: the I/O module involved, location of data in memory, and the size of block of data to be transferred. CPU then can continue with other instructions and the DMA controller will interrupt in when the transfer is completed. The DMA controller and the CPU cannot use the system bus at the same time, so memory way must found to share the bus between them. One of two Methods is normally used.

**Burst Mode:** The DMA controller transfers block of data by halting the CPU and controlling the system bus the duration of Transfer.

**Cycle Stealing:** The DMA controller transfers data one world at a time, by using the bus when the CPU is not using it, or bypausing the CPU for a single clock cycle on each instruction.

**INTRRUPTS**

An interrupt is a special signal that cause the computer’s central processing unit suspend what it is doing and transfers its controls to a special program called an interrupt handler. The interrupt is responsible for determining the cause of the interrupt, servicing the interrupt, and on retuning the control of the processor to the point form where the interrupt was caused.

**Types of Interrupt:** Interrupts are typically caused by events that are other internal or external to the CPU such as:

**Program Interrupt** (also called trap), caused internally by the CPU during instruction execution such division by zero, accessing illegal memory location, stack overflow.

**Timer interrupt,** caused by the timer internal to CPU such as time out event. When a program is trapped is an endless loop.

* **Hardware Interrupt,** cause by some external device such as request to start an I/O, or occurrence of hardware failure.
* **Software Interrupt,** which can invoked with the help of INT instruction. A programmer triggered this event that immediately stops execution of the pro; and passes execution over to the INT handler. The INT handler is usually a part of the operation system and determines the action to be taken (e.g. output to screen, execute file etc.)

**Interrupt Priority:** when two or more interrupt occur at the same time, the CPU uses a priority

system. The processor would deal with interrupt having higher priority first, and then deal with the lower priority interrupts afterwards. For example, an interrupt form a disk driver must be handled more quickly than an interrupt from a keyboard. An Interrupt ends when program ex/// the REIT (Return from Interrupt) instruction and the processor restores the normal program exec/////

**COMPUTER VIRUS**

A virus is a program which is designed to replicate, in order to spread from one system to another, its work is usually to destroy data or sometimes to entire hard disk. An active virus can delete or damage files: can format the entire hard disk or can damage the file allocation table (FAT) of system.

**Types of viruses**

**File Infector:** these viruses attach to other program and get activated when the program is executed. The copies or Virus are executable ones. Once the infected program runs, other program files are also.

**File Infector viruses:** File infector viruses attach at the start or the end of executable COM and EXE files. When the infected file is executed, a virus gets executed first, takes over the control of system parameters, and resides in the RAM.

**Boot Sector virus:** Viruses effect the DOS operating system files **IBMBIOS, COM. IBMDO,COM** and **COMMAND, COM.** The enter the systems in the guise of device drivers which are loaded into the memory before any other program.

**To avoid system from being infected from virus the following measure can be taken:**

* Do not use outside floppy disks on your PC
* Use the original versions of operating systems to reboot the system.
* Program and data should be saved & frequent back up should be taken.
* Avoid playing computer games on the computer where important data is stored.
* If the PC is infected do not use it before it is cleaned properly.

**Antivirus Program**

These programs serve the purpose of vaccines for computer. **E-scan, MacAfee, Dr.lolemon, Norton** are some of the antivirus available.

**MULTIMEDIA**

Multimedia (Lat. Multan + Medium) is media that uses multiple forms of information content and information processing (e.g. text, audio, graphics, animation, video, and interactivity) to inform or entertain the (user) audience. Multimedia also refers to the use of (but not limited to) electronic media to store and experience multimedia content. Multimedia is similar to traditional mixed media in fine art, but with a boarder scope. The term **rich media** is synonymous for interactive multimedia.

Multimedia means the computer info can be represented through audio, graphics, image, video, and animation in addition to traditional media (text and graphics). Hypermedia can be considered one particular multimedia application.

**Categorization:**

Multimedia may be broadly divided into linear and non-linear categories. Linear active content progresses without any navigation control for the viewer such as a cinema presentation. Non-linear content offers user interactivity to control progress as used with a computer game or used in self-paced computer based training. Non-linear content is also known as hypermedia content.

**Features:**

Multimedia presentations may be viewed is person on stage, projected, transmitted, or played locally with a media player. A broadcast may be a live or recoded multimedia presentation. Broadcasts and recoding can be either analog or digital electronic media technology. Digital online multimedia may be downloading or streamed. Streaming multimedia may be live or on-demand.

Multimedia games may be played in person in an arena with special effects, with multiple users in an online network, of locally with an offline computer of game system.

**Application:**

* World Wide Web
* Hypermedia courseware
* Video conferencing
* Video-on-demand
* Interactive TV
* Groupware
* Home shopping
* Games
* Virtual reality
* Digital video editing and production systems
* Multimedia Database systems

**Multimedia Systems**

A multimedia System is a system capable of processing multimedia data and application. A multimedia system is characterized by the processing, storage, generation, manipulation, and rendition of multimedia information.

**Characteristics of a Multimedia System**

* Multimedia systems must be computer controlled.
* Multimedia systems are integrated.
* The information they handle must be represented digitally.
* The interface to the final presentation of media is usually interactive.

**Components of a Multimedia System**

Now let us consider the Components (Hardware and Software) required for a multimedia system:

**Capture device**

Video Camera, Video Recorder, Audio Microphone, Keyboards, mice, graphics tablets. 3D input devices, tactile sensors, VR device, Digitizing, / sampling Hardware.

**Storage Devices**

--Hard disk, CD-ROM, jaz/Zip drives, DVD, etc.

**Communication Networks**

--Multimedia Desktop machine, Workstation, MPEG/VIDEO/DSP Hardware

**Display Devices.**

--CD-quality speakers, HDTV, SVGA, Hi-Res monitors, Color printers etc.

* **Multimedia Software tools**

**Digital Audio:** macromedia Sound edit-Edits a variety of different format audio files, apply a variety of effects.

**Music Sequencing and Notatio**

**Cakewalk**

* Supports General MIDI
* Provides several editing views (staff piano roll event list) and Virtual Piano
* Can insert WAV files and Windows MCL commands (animation and video) into tracks.
* **Cubase**
* Better software than Cakewalk Express.
* Intuitive Interface to arrange and play Music.
* Wide Variety of editing tools including Audio.

**Image/Graphics Editing**

* **Adobe Photoshop**
* Allows layers of images, graphics and text
* Includes many graphics drawing and painting tools
* Sophisticate lighting effects filters
* A good graphics, image processing and manipulation tool
* **Adobe Premiere**
* Provides large number (up to 99) of video and audio tracks, superimpositions and virtual clips
* Supports various transition, filters and motions for clips
* A reasonable desktop video editing tool
* **Macromedia freehand**
* Graphics drawing editing package
* **Animation**
* Avid Softimage
* Animated Gif building packages e.g. GifBuilder

**Multimedia Authoring**

--tools for making a complete multimedia presentation where users usually have a lot of interactive controls.

* **Macromedia Director**
* Movie metaphor (the cast include bitmapped sprites scripts, music, sounds, and palettes, etc.)
* Can accept almost any bitmapped file formers.
* Lingo script language with own debugger allows more control including external device, e.g. VCRs and video disk players.
* Ready for building more interactivities (bottom etc).
* **Author ware**
* Professional multimedia authoring tool
* Supports interactive application with hyperlink drag-and-drop controls, and integrated animation.
* Compatibility between files produced form PC version and MAC version

**COMPUTER NETWORK**

When two or more computer are connected together to share the resources, the computer are said to be under networks. The main computer in the networks where all the data is stored in known as server. A computer network can be defined as a grouping or interconnection of the different on a single platform for information exchange amount the various nodes

**Need for networking**

* Sharing of resources.
* Sharing of data.
* Reliability.
* Communication speed of accuracy.
* Cost factor (economical)

**Components of Network System**

* **Nodes (work station):** Different terminals or computer attached to than network that share the resources of network are known as nodes or work station.
* **Sever:** A server is a computer that facilitates data sharing, hardware & software resources on the network.
* **Network Interface Unit (NIU): NIU** is device which is attached to a server & the work station to maintain the connection b/w them/.

**Types of Network**

* **LAN (local Area Network):** LAN is confined to small area e.g. an office a building or a factory. In other words, the interconnection of small computer, micro computer of personal computer in a single network configuration at a particular site.
* **WAN (wide Area Network):** A collection of network nodes separated by the large distances is called a wide area network. It spread over lager are coving////.
* **MAN (Metropolitan Area Network):** MAN spread over cities and over an area of 100 km or so.

**Communication Channel**

It refers to a path, a line, or link that into connects a source from which data is sent to its destination. Most important

Transmission media area.

* Twisted Transmission Cable.
* Coaxial Cable
* Microwave Transmissions

**Network Topology**

The term topology refers to a way in which the end points or the station of a network and linked together. The different types of topology are:

* **Start Topology:** in a star topology of computer network, thus is a host computer which is attached to a local computer through multiple communication lines. Te local computers are not linked directly to each other and can communication only the host computer.
* **Bus Topology:** A bus topology network typically uses one lone cable, called a backbone; short cable called drop cable can be attached to the backbone using cable.
* **Ring Topology:** There is no main or controlling computer in this network. Each ring processor has communication subordinate but within the ring there is no master computer for controlling other computer thus each node of a ring network must have simple communication capability. A node received data from one of it’s the adjacent node. The data is for use or not.
* **Tree topology:** A variation of bus topology is the tree topology the shape of network is this topology is that of an invented tree having the central route branching and sub branching to extremities of this network.
* **Graph Topology:** In this topology nodes are connected to each other in arbitrary fashion. A link may or may not connect two or more nodes. There may be multiple links also. It is not essential that all the nodes in this topology are connected.

**Transmission across Network**

* **Digital and analog Transmission:** In digital signal the sequence of voltage pulse in binary form an analog signals the transmitted power various, over continuous range. Thus analog wave forms continuous curve.
* **Modem:** A modem is a device that allows communicating a computer with another computer by telephone line. The technique which converts the digital signals to analog form is known as modulation & the technique which converts analog signals in to digital form is known as demodulation.
* **Protocol:** A protocol is a set of rules that define how computer transmit information to each other enable different type of computer and the software to communicate with each other. In other words protocol means the rule that is applicable for the network. Different types of protocols are.
* TCP (transmission Control protocol).
* IP (internet protocol).
* FTP (File Transfer Protocol).
* SMTP (Simple Mail Transfer Protocol).
* **OSI Model**

Open system interconnection on the model is blue print for a set of worldwide Communication standard the enable all the computer to get interconnected easily. The OSI model is a framework defines what the protocol of each layer should do. Defines entities of each layer and the service exchange between these layers.

Application

Application

Presentation

Presentation

Session

Session

Transport

Transport

Transport Layer

Transport Layer

Transport Layer

Transport Layer

Transport Layer

Transport Layer

Transport Layer

Transport Layer

Transport Layer

Transport Layer

Transport Layer

Transport Layer

Transport Layer

Transport Layer

Transport Layer

Transport Layer

Transport Layer

Transport Layer

Transport Layer

Transport Layer

Network

Network

Data Link

Physical

Physical

1. Application Layer.

2. Presentation Layer.

3. Session Layer.

4. Transport Layer.

5. Network Layer.

6. Data Link Layer.

7. Physical Layer

**Application Layer:** This layer specifics the communication interface with the uses & manage communication between computer application. It provides the service that directly supports the end user of the network.

**Presentation Layer:** This layer, transform data into a mutually agreed format, that can be understood by each application and by computer they run on the layer as

per the requirements can encrypt of decrypt, expend, or compress the data.

**Transport Layer:** This layer ensues that all transmitted data is received in proper and complete sequence. All the destination if performs error detection on incoming massage to ensure that they are duplicate or ret wrongly delivered to any source on destination.

**Network Layer:** This main objective of the network layer is to move information access the network.

**Data Link Layer:** This layer organize the physical one’s (1’s) and zero’s (0’s) into frame bit, logical grouping of information. A frame is continuous sense of data with an independent logical meaning. The data link layer also detect and sometime carried errors, central data flow identifies particular computer on network.

**Physical Layer:** This layer covers the physical interface between the devices, it defines the electrical and mechanical specification of the network medium and the network interface hardware, and how they connect to one another.

**Client Server Model of the Network:** A client server model of commuting is based on distributed network computing. In this model, an application is executed co-operatively by two computers. A client and a server. A client is a front end compute and a server nodes can be computers a same network or on different network thousands of kilometer a part.

**Host (server):** A collection of machine in a network which are intended for running uses application are known as host.

**Back bone network:** A backbone network is a network that is used as a backbone to connect smaller independent network.

**Repeater:** A repeater is device that amplifies a signal being transmitted on the network use.

**Bridge:** A bridge is used to connect two LAN of same type when a bridge is connected between two LAN it examine each message on a LAN passing those lone to within the same LAN, and forwarding those on the other interconnected LAN.

**TERMINOLOGY**

**FTP (file transfer protocol):**  Internet gives us access to all kind of information. It can be used to copy any file from the internet host to other. Some of the important useful of FTP are:

It is very useful to transfer file from one network in a organization to other.

It is popular way to share information across the internet.

**Internet Protocol:** This is a protocols used by the internet form transfer ring message form from one machine to another.

**TCP (transmission Control Protocol):** It provides logic for ensuring the reliable delivery of data to the exchanged between the host systems.

**Routers:** A Router is device that works like but can handle different protocols.

**Gateway:** It is device that connect dissimilar network. These devices perform the protocol conversion between the networks which have different protocol familiars.

**Telnet (Remote Login):** It is a form of dial up connection between the two computers for exchange of data.

**SMTP (Simple Mail Transfer Protocol):** This protocol helps the user to send the mail to other network of computers.

**Homepage:** A homepage contain the details about at particular entity such as a person, a company, a group of people, or an organization.

**WWW (World Wide Web):** The www is graphical, colorful uses friendly interface to the internet. It allows the use to browse information across the internet without the necessity to login.

**Gopher:** It is a tool that makes internet easy to work with. It is a menu driven program and movement of cursor help is selecting the choice.

**Usenet:** It is a public network made up of thousands of new group. A news group is a collection of message with related topic or them such as seminar conference etc.

**WAN (Wide Area Information Network):** It is network information retread system.

**Bandwidth:** The range over which frequency of a commission signal may vary in known as bandwidth.

**Baseband:** The range over which frequencies representing the signals supplied by the source of information.

**Extranet:** The contents of extranet server specifically designed for a select group of user/audience typically company’s supplier, business associates.

**ISDN:** It stands for integrated service Digital.

**BPO:** Business Process Outstanding.

**URL:** Uniform Resource latter.

**.RG:** Organizational data.

**.edu:** Educational domain.

**.com:** commercial.

**.co.in:** Cooperation in India domain.

**DATABASE MANAGEMENT SYSTEM**

A database is a collection of related information stored so that it is available to many users for different purposes. The content of database is obtained by combining data from all the different sources in an organization. So that data are available to all users and redundant data can be eliminated or at least minimized. A computer database gives us some electronic filing system. Which has a large numbers of ways of cross referencing, and this allows the user many different ways to recognize and retrieve data. A sales base can handle business inventory, accounting, and filing & use the information in its files to prepare summaries.

**Features of a Database Management System**

There are three main feature of database management system that makes it attractive to use a DBMS in preference to other system. These features are:

* Centralized data management.
* Data independence.
* Systems integration

**Advantage of Database Management System**

* Redundancies and inconsistencies can be reduced
* Better service to the Users.
* Flexibility of the system is improved.
* Cost of developing and maintaining system is lower.
* Standards can be enforced.
* Security can be improved.
* Integrity can be improved.
* Enterprise requirements can be identified.
* Data model must be developed.

**Functions of Database Management System**

This function will include support for a //// all of the following:

**Data definition:** The DBMS must be able to accept data definitions are source form and convert them to the appropriate object from.

**Data manipulation:** The DBMS must able to handle requests from the user to retrieve, update, or delete existing data in the database to add new data to the database.

**Data security and integrity:** The DBMS must monitor user requests and reject any attempt to violate the security and integrity rule designed by the DBA.

**Data dictionary:** The DBMS must provide a data dictionary function. The dictionary contains ‘data about the data’ (sometimes called metadata)- that is, definition of other objects in the system-rather the just ‘raw data’.

**Data Modes:-**

A data model is a collection of concepts that can be used to describe the structure of a database and provides the necessary means to achieved this abstraction whereas structure of a database means the data types, relationships an constraints that should hold on the data.

**Network Model:-**

Data in the network model is represented by collection of records, and relationship among data is represented by links, which can be viewed as pointers. The records in the database are organized as collection of arbitrary graphs.

**Hierarchical Model:-**

The hierarchical model is similar to the network model in the sense that data and relationships among data are represented by records and links, respectively. It differs from the network model in that records are organized as collection of trees rather than arbitrary graphs.

**Relational Model:-**

**(RDBMS-relational database management system)** A database based on the relational model developed by E.F. Code. A relational database allows the definition of data structures, storage and retrieval operations, and integrity constraints. In such a database the data and relations between them are organized in tables. A table is a collection of records and each record in a table contains the same fields. Some Properties of Relational Tables:

**Values are Atomic.**

**Each Row is Unique.**

**Column Values are of the same kind.**

**The Sequence of Rows is Insignificant.**

**Each Column has unique Name.**

**The Entity- Relationship Model**

The E-R (entity-relationship) data model views the real worlds a set of basic objects (entities) and relationships among these objects. It is tended primarily for the DB design process by allowing the specification of an enterprise scheme. This represents the overall logical structure of the DB.

**OBJECT-ORIENTED PROGRAMING**

Object oriented programming (OOP) is a programming paradigm that uses ‘object’ to design application and computer program. It user several techniques from previously established paradigms, including inheritance modularity, polymorphism, and encapsulation. Even though it originated in the 1960s. OOP was not commonly used in mainstream software application development until the 1990s. today, may popular programming language support OOP.

**Fundamental concepts**

Fundamental concepts identified in the strong majority of definitions of OOPS are.

**Class :-** A class defines the abstract characteristics of a thing (object), including the thing’s characteristics (its attributes, fields or properties) and the thing it can do (its behaviors or methods of feature). Collectively, the properties and methods defined by a class are called members.

**Object:-** A particular instance of a class. The set of values of the attributes of a particular object is called its state.

**Method:-** An object’s abilities. Within the program, using a method should only affect one particular object.

**Massage passing:-** A process by which an object sends data to another object to invoke a method. Also known to same programming languages as interfacing.

**Inheritance:-** In some case, a class will have ‘subclass,’ more specialized versions of a class. Subclass inherits attributes as behaviors from their parent class, and can introduce their////. Each subclass can alter its inherited traits.

**Encapsulation:-** Encapsulation conceals the exact detail of how particular class works form objects that use it code or send message to it. Encapsulation is achieved by specifying which class may use the members of an object. The result is that each object exposes to any class a certain interface-those members accessible to that class.

**Abstraction:-** Simplifying complex reality by modeling classes appropriate to the problem, and working at the most appropriate level of inheritance for a given aspect of the problem. Abstraction is also achieved through composition.

**Polymorphism:-** Polymorphism allows you to treat derived class member just like their parent class’s member. More precisely, polymorphism in object-oriented programming in the ability of object belonging to different data types to respond to method calls of methods of the same name, each one according to an appropriate type-specific behavior.

**SOFTWARE ENGINEERING**

Software engineering is defined as the systematic and scientific approach to develop, operate, maintain and to retire the software product. Software product means software for a large /medium size and complex problem. We get real advantage of software engineering when it’s applied to a project. Though it can also be used.

**Another definition of software engineering may be:-**Software engineering is the application of science and mathematics, by which the computer hardware is made useful to the user via software (computer programs, procedures, and associated documentation). The main objective of software engineering is to produce good quality software with minimum cost and within the limited allowed time period.

**Software Engineering Phases:-** The software is said to have a life cycle composed of several phases. Each of these phases results in the development of either a part of the system or something associated with the system. Such as a test plan or a user manual.

**Requirements Analysis and Specification:-** The purpose of this to phase is to identify and document the exact requirements for the system. Such study may be performed by the customer, the developer, a marketing organization, or any combination of the three. There are two major activities in this: problem understanding or analysis and requirement specification.

**Software Design and specification:-** Once the requirements for a system have been documented, software engineers design a software system to meet them. This phase is something split into two phase: **architectural of high level design and detailed.** High –level design deals with the overall module structure and organization, rather than the details of the modules. The high-level design is linked by design each module in detail (detail design).

**Coding and module Testing:-** This is the phase the produces the module code that will be delivered to the customer as the running system. The other phase of the life avoid may also develop code, such as prototypes, tests, and test drivers, but these are for use by the develop.

**Integration and System Testing:-** All the modules that have been developed before and tested individually are put together integrated in this phase and tested as a whole system. The standing point of testing is unit testing. The purpose is to exercise. The different parts of the module code to detach coding errors. After this, the modules are gradually integrated into subsystems, which are then integrated to eventually form the entire system. After the system is put together system testing is performed to see if all requirements are met ad if the system performs as specified by the requirements, finally, acceptance testing is performed to demonstrate to the client, on the real-life data of the client, the operation the system.

**Delivery and Maintenance:-** Once the system passes all the tests, it is delivered to the customer and enters the maintenance phase. Any modifications made to the system after initial delivery is usually attributed to this phase.

**Software Processes:-** The concept of process is the main step in the software engineering approach. The process means a particular method of doing something, generally involving a number of steps or operations. In software engineering, the phrase software process refers to the method of developing software; we now discuss some of the common process models that have been proposed.

**Spiral Model:-** The spiral model is a software development process combining elements of both design and prototyping-in-stages, in an effort to combine advantages of top-down and bottom-up concepts. In this model the software is developed in a series of incremental releases with the early stages being either paper models or prototypes. Later iteration becomes increasingly more complete version of the product.

**Waterfall Model:-** The waterfall mode is a sequential software development model (a process for the creation of software) in which development is seen as flowing steadily downward (like a waterfall) through the phase of requirement, analysis, design, coding (implementation) testing validation and maintenance.

Requirements

Analysis

Design

Coding

Testing

Maintenance

**Ext**

NUMBER SYSTEM 5

**DIGITAL ELECTRONIC**

Digital electronic is the most common representation of Boolean algebra and is the basics of all digital circuits for computers. The purpose of this section is to discuss the various aspects of Digital Electronics. If further includes the different concepts of digital system as Boolean logic and circuits.

**Topics covered in this section are**

1. **Number system**

* Significant Digits.
* Different number system.
* Arithmetic with Non-decimal Number system
* Complement Notation
* Binary codes.

**2. Boolean Algebra**

* Logic gates.
* Theorems and Postulates
* Simplification of Boolean Expression.
* SOP and POS Notation
* Venn Diagrams

**Digital Circuits**

* Combinational Circuits
* Address
* Subtracters
* Encoders
* Decoders
* Multiplexer
* Demultiplexer
* Sequential Circuits
* Flip-Flop
* Counters
* Registers

**NUMBER SYSTEM 1**

**SIGNIFICANT DIGIT AND ERRORS**

**Significant Digits:** Following rules determiners the number of significant in a number.

* All non-zeros and zeros between non-zeros are significant.
* All zeros preceding the leftmost non-zero are no significant.
* All zeros at the rightmost position are significant provided they are preceded by at least one non-zero digit.

**Examples**

1. How many significant digits are there in

(a) 4.050

(b) 0.0412

(c) 912.000

(d) 000.000001

**Solutions :**

(a) Ans.3 all digits are significant

(b) Ans.3 0.0412(zero’s are Not significant)

(c) Ans.3 all significant

(d) Ans.6 only 1 is significant digit

**Rounding off a Number:** Given any number A=………………..x (with k digit between decimal point & x), which is to be rounded off to k decimal places then the process is:

* If x>5 add 1 to kth decimal places then the process is:
* If x<5 leave the number unchanged.
* If x=5 then
* If x is followed by a non-zero digit or k decimal digit is odd, then add 1 to kth decimal else lever the number unchanged.

**Truncation of Number:** Truncation is the process of chopping, leaving, or dropping the digit which are not required.

While truncating a given number to kth decimal digit, all the digits following kth digit are dropped.

**Error**

Error = Original value

∆X = X- X1

If X1 is rounded value of X then ∆X is called **Rounding Error**

If X1 is truncated value of X then ∆X is called **Truncation Error**

**Note: 1.** Rounding Error can be positive or negative:

1. Truncation Error is always positive for positive number and negative for negative numbers.

**Relative Error**

**Percentage Error** =Er\* 100 (Er is relative error)

Limit of magnitude of relative Error when error is,

Rounding Error→ 0 to 0.5\*101-k

Truncation Error→ 0 to 101-k

**Examples:**

**1.** Truncate and Round off 35.09842 to 3 decimal places

**Solution:** When truncated to 3decimal places=35.098 when round off to 3 decimal places= 35.099

2. Round off 8.423019 to five significant digits:

**Solution** 5 significant digits her means up to 4 decimal places. Therefore, Answer=8.4230.

3. Number 9.089 is truncated to 3 sig. digits then truncating error is (a) 0.001 (b) 0.0009 (c) 0.01 (d) none of these.

**Solution** (b) X=9.089 X1=9.08 ∆X=0.009(X-X1)

4. 0.0087961 when truncated to 3 significant digits yields

**Solution:** 0.0087961 because we are asked to truncated to 3 significant digits and not 3 decimal places.

**Weight associated with a position in a number:** Take the decimal number 5240.3 as an example to explain the weight of each position of the number.

5240.3=5\*103 +2\*102 +4\* 101 + 3\* 101

Powers of 10 on the right side of above equation are associated with respective position in general,

Weight of rth position to the left of decimal point= 10r-1

Weight of kth position to the right decimal point= 10-k

**Note:** Contribution of each digit in magnitude of a number is equal to the product of digit and weight associated with the position at which the digit is present in the number.

e.g. in 444.44 contributions of all 4’s diff.(viz 4x 102, 4 x 101 ,4 x 100 , 4 x 10-1, 4 x 10-2) in the magnitude o the number.

Therefore the contribution of same digits are different because of their different position in the number Value of the number = sum of contribution of all digits appearing in the number.

**DIFFERENT NUMBER SYSTEM**

**Non- Positional Number System**

In a non-position number system, on weight is assigned to any position. Therefore contribution of each digit is fixed irrespective to its position in the number. An example of this system is Roman Number System. Consider III (3 in roman number system), all the vertical bar have same weight (one) in number, though they are all different position in the numbers.

**Positional Number System**

Our decimal number system is known as position number system, because the value of the number depends on the position of the digits. From example, the number 123 has a very different value then the number 321, although the same digit is used in both numbers. In a position number system, the value of each digit is determined by which place is appears in the full number, the lowest place value is the rightmost position, and each successive position, and each successive position to the left has a higher value.

* **Decimal Number System**

In our decimal number system, the rightmost position the nose column, the next position represents the tens column, the next position represents hundreds, etc. therefore, the number 123 represents 1 hundred and 2 tens and 3 ones, whereas the number 321 represents 3 hundreds and 2 tons and 1 one. The value of each position corresponds to powers of the base of the number system. So for our decimal number system, which uses base 10, the place values correspond to powers of 10:

….1000 100 1

….10^3 10^2 10^0

* **Binary System:**

The binary number system (base 2 numerals) represents numeric values using two symbols, typically 0 and 1 more specifically, the usual binary numeral system is a positional notation with a radix of 2. In an n-bit binary number, the most significant bit is usually the 2n-1 s place. If the sign bit is 0, the value is positive; if it is 1, the value is negative.

* **Octal Number System**

The octal number system has a base of eight, meaning that it has eight possible digits: 0,1,2,3,4,5,6,7. Hexadecimal Number System.

* **Hexadecimal Number System**

The hexadecimal system uses base 16. Thus, it has 16 possible digit symbols. It use the digits 0 through 9 plus the letter A,B,C,D,E and F as the 16 digit symbols.

* **Floating-point numbers**

The basic idea behind floating-point numbers is to represent a number as mantissa and an exponent, each with a fixed number of bits of precision. If we denote the mantissa with m and the exponent with e, then the number thus represented is m\*2e . To obtain a canonical form. We simply add a rule that m must be greater than or equal to ½ and strictly led then 1. If we write such a mantissa in binary (analogous to decimal) form, we always get a number that starts with 0.1

**CONVERSIONS**

* **Converting form other Number Bases to Decimal**

The binary number system uses base2, so the place value of the digits of a binary numbers corresponds to prower2. For example, the value of the binary number 100011 is determined by computing the place value of each of the number:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 1 | 0 | 0 | 1 | 1 | The binary umber |
| 2^4 | 2^3 | 2^1 | 2^1 | 2^0 | Place values |

So the binary number 10011 represents the value.

|  |
| --- |
| (1\*2^4)+( 0\*2^3)+ (0\*2^2)+(1\*2^)+(1\*2^0)  =16 + 0 + 0 +2 +1  =19 |

The same principle applies to any number base. For example, the number2132 base 5 corresponds to

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 2 | 1 | 3 | 2 | Number in base 5 |
| 5^3 | 5^2 | 5^1 | 5^0 | Place values |

So the value of the number is

|  |
| --- |
| (2\*5^3)+(1\*5^2)+(3\*5^1)+(2\*5^0)  =(2\*125)+(1\*25) + (3\*5) +(2\*1)  =250+ 2 +15 +2  =292 |

To convert a **hexadecimal number into its decimal equivalent,** multiply the decimal equivalent of each hexadecimal digit by corresponding power of 16 and add the resulting values:

C0E716 =(12\*163)+( 0\*162)+(14\*161)+(7\*160)=(12\*4096)+(0\*256)+(14\*16)+(7\*1)=49,38310

* **Converting from Decimal to Other Number Bases**

In order to convert a decimal number into its representation in a different number base. We have to be able to express the number in terms of power of the other base. For example, if we wish to convert the decimal number 100 to base 4, we must figure out how to express 100 as the sum of power of 4

|  |
| --- |
| 100 = (1\*64) + (2\*16) + (1\*4) + (0\*1)  =(1\*4^3) + (2\*4^2) + (\*4^1) + (0\*4^0) |

Then we use the coefficients of the powers of 4 to from the number as represented in base4;

100 1 2 1 0 base 4

One way to do this is to repeatedly divide the decimal number by the base in which it is to be converted, until the quotient becomes zero. As the number is divided, the remainders- in reverse-form the digits of the number in the other base.

**Example:** convert the decimal number 82 to base 6:

82/6 = 13 reminder4

13/6 = 2 reminder1

2/6 = 0 reminder2s

The answer is formed by taking the remainders in reverse order: 214 base 6 Binary-to-decimal equivalence

12 = 0\*20 = 1\*1 = 110

102 = (1\*21) + (0\*20) = 2\*0 = 210

1012 = (1\*22) + (0\*21) + (1\*20) = 4+ 0 + 1= 510

Please note that the number of digit in any base (radix)N is exactly the same number N. for example, in the binary (N=2) system there are two digits: 0 and 1 in the decimal (N=10) there are ten of them:

0,1,2,3,4,5,6,7,8,9

If N>10, the missing digits from the alphabet (usually disregarding the case). Thus A stands for the decimal 10 in any number system with base greater than 10. B stands for the decimal 11 in any number system with base then 11, and so on. It is customary to prefix hexadecimal number with 0x and total with 0. The convert will accepts this common notation which is, however, no necessary. Representation of a number in system with base (radix) N may only consist of digits that are less than N. more accurately, if

(1) M=akNk  + ak-1Nk-1 ……………………+ a1N1 +a0

With 0<ai<N we have a representation of M in base N system and write M=) ak ak-1….. a0)N

If we write (1) as

(2) M= a0 + N(a1 + N(a2 +N……….))

The algorithm of obtaining coefficients ai becomes more obvious. For example, a0 = m (mod N) and A1 =(M/N) (mod N), and so on.

* **Converting from Binary to Other Number bases**

Binary may be converted to and from hexadecimal somewhat more easily. This is due to the fact that the radix of the hexadecimal system (16) is a power of the radix of the binary system (2). More specifically, 16=24 , so it takes four digits of binary to represent one digit of hexadecimal. The following table shows each hexadecimal digit along with the equivalent decimal value and four-digit binary sequence:

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Hex** | **Dec** | **Binary** | **Hex** | **Dec** | **Binary** | **Hex** | **Dec** | **Binary** | **Hex** | **Dec** | **Binary** |
| 0 | 0 | 0000 | 4 | 4 | 0100 | 8 | 8 | 1000 | C | 12 | 1100 |
| **1** | 1 | 0001 | 5 | 5 | 0101 | 9 | 9 | 1001 | D | 13 | 1101 |
| **2** | 2 | 0010 | 6 | 6 | 0110 | A | 10 | 1010 | E | 14 | 1110 |
| **3** | 3 | 0011 | 7 | 7 | 0111 | B | 11 | 1011 | F | 15 | 1111 |

To convert a **binary number into its hexadecimal equivalent,** divide it into groups of four bits. If the number of bits isn’t a multiple of four, simply inset extra 0 bits at the left (called padding). For example:

101000102 =01010010 grouped with padding =5216

110111012=11011101 grouped=DD16

**Binary** is also easily converted to the **octal numeral system,** since octal uses a radix of 8, which is a power tow (namely.23 so it takes exactly three binary digits to represent an octal digit). The correspondence between octal a binary numerals is the same as for the eight digits of hexadecimal in the table above. Binary 000 is equivalent to the octal digit 0, binary 111 is equivalent to octal7, and so on.

Octal 0 1 2 3 4 5 6 7

Binary 000 001 010 011 100 101 110 111

* **Converting from Other Number Bases to Binary**

To convert a **hexadecimal Number into its binary equivalent,** simply substitute the corresponding binary Digits:

3A16 =001110102

E716=111001112

Converting from **octal to binary** proceeds in the same fashion as it does for hexadecimal with differences that we form three-digit binary sequence.

658=1101012

1278=0011112

And from binary to octal:

1011002 =1011002 grouped =548

100112 =0100112 grouped with padding=238

And form octal to decimal

658 = (6\*81) + (5\*80) = (6\*8) + (5\*1) =5310

1278 = (1\*82) + (2\*81) + (7\*80) = (1\*64) + (2\*8) + (7\*1) = 8710

**Example**

1. (6BC) 16 =(x) 2 = (y) x find x and y

**Sol.** 6 B C

0110 1011 1100

(6BC) 16 = (011010111100) 2

Giving each digit, 4 bit representation

Now making groups of 3 bits

011—— 010 111 100

3 2 7 4 = (3274) 8

2. Convert 345.6710 to hex

**Sol:** (159.AB85) 16

3. Convert 30.30. to its binary equivalent.

**Sol.** Integral part 30.

Remainder

2 30

2 15 - 0

2 7 - 1

2 3 - 1

2 1 - 1

0 - 1 (30)10 (1110)2

Repetition starts, therefore (0.30)10=(010011001..)2 hence (30.30)10 =(1110.01001)

4. Convert (101) 16 to equivalent number in base 12.

**Sol.** (101) 16 = 162  + 0\*161 + 1\*160=256+0+1=257 Now Converting (257) 10 to base 12

Hence: (101)16 = (195)12

**Arithmetic with Non decimal Number**

Addition and subtraction of non decimal numbers is very similar to decimal number, except we express the result in the required base, in which the numbers are given. To add two binary numbers, we start from that right and work left, adding each column and including the carry out of each column in the next column’s sum. In the first example below, we begin with adding the two 1’s together, result of 1+1 is 10 (binary 2), write the LSD of sum (0 in this case) in same column, and carry (1 here) above the next column, proceed similarly with rest of the bits. This procedure works the same for binary number containing binary points.

**Example**

1. Add 001111012 and 101001012

|  |  |  |
| --- | --- | --- |
| Caries 11  61  +16510 | 11111  00111101  10100101  111000102 | 11  75  245  3428 |

1. Adding 47.999375 with 158.1250

|  |  |
| --- | --- |
| Caries 1 11 1  47.9375  +158.1250  206.062510 | 11111111  00101111.1111  10011110.0010  11001110.00012 |

In above examples, the 1’s above the number indicate the carry digit.

Binary subtraction is performed similar; using borrows instead of carries between steps. In the example below, first tow columns from right are subtracted normally. Third column of minuend is less than that subtrahend, thus borrow is required from the fourth column, but fourth column has nothing to lend, so we look at the fifth column for a borrow. Fifth column donates it’s one, which make it 0. Fourth column of minuend becomes 10 i.e. after receiving borrow from the fifth column, third column can now borrow from the fourth column. After this entire episode of borrow, values at 5th, 4th & 3th column of minuend are respectively 0, 1 and 10(all in binary).

**Borrow**

|  |  |
| --- | --- |
| 211  -110  10110 | 10101010  11010011  -01101110  011001012 |

Multiplication and division in a radio system other than decimal are performed in a manner, similar to decimal system. The only difference is that you have to consider the given radix system.

**Example: Multiplication**

|  |  |  |
| --- | --- | --- |
| Binary  1 0 1 1 0 1 1  X 1 0 1  1 0 0 1 1 0 11  0 0 0 0 0 0 0 x  10 0 1 1 0 1 1 x x  1 1 0 0 0 0 0 1 1 1 | Hexadecimal  9 D  \* 5\_\_\_  311 | Decimal  1 5 7  \* 5\_\_  7 85 |

**Division:**

**Binary**  **hexadecimal Decimal**

100001.0 21.66 33.4

101 1010011.100 5 A7.00 5 167.0

101 A 15

000111 07 17

101 5 15

01000 20 20

101 1E 20

11 2 \*

Not that while decimal division terminates, neither the binary nor the hexadecimal does. This points out that conversion between number system may, not be exact and leading to errors in calculations. The problem arises because of the fact that computers system has a limited number of bits to represent numbers.

**Example:**

1. Result of 11000.01-1001.11 Borrow 1110

1100.01

1001.11

0010.10

2. Find (436)8 + (242)8 3. Add 324.58

**Solution** 1 1 **Solution** Carry 1 1

436 324.5

242 512.3

700(6+2=10, value of 8 in octal) 1037.0  
 **Not:-** when result is 10 (octal 8) sum is 0 & carry

**Complement of number**

There are two types of complement of any number in any base r,r-1’

* **Complement and R’s complement**

In particular 9’s and 10’s complement for decimal number, 1’s and 2’s for binary numbers, 7’s and 8’s complement for octal and 15’s & 16’s complement for hexadecimal numbers.

For a base R system, the word length = n bits, for a positive number, N the **R’s complement is** Rn – N and R-1’s **complement is (**Rn-1**)**-N

r-1’s complement is also obtained by subtracting each digit of the number from r-1

r-1’s complement is 1 added to the LSD of r-1’s complement

**example:** find9’s and 10’s complement of following decimal number 1265.45,56327.32.

**sol.** 9’s complement of 1265.54=8734.45 subtracting individual digit from 9

|  |
| --- |
| 8 7 3 4 .4 5  + 1  8 7 3 4 .4 5 |

10’s complement =

1 added to LSD for

Complement

* **One’s complement**

In the one’s complement representation, the leftmost 0 for positive numbers and is 1 for negative number, as it is for the signed magnitude representation. Negative number is stored as their ones complement. Consider again representing +12 and -1210 In eight-bit format using the one’s complement representation.

1 210 = 0 0 0 0 1 10 02

-1210 = 1 1 1 1 0 0 1 12

Note again that there are representation for both +0 and -0, which are 00000000 and 11111111, respectively. As a result, there are only 28 -1 = 255 difference number (from -127 to +127) that can be represented even though there are 256 difference bit pattern possible for on 8 bit computer.

One’s complement representation is not commonly used. This is at least partly due to the difficulty in making comparisons when there are two reorientations for zero, and party because of additional complexity involved in adding numbers in one’s complement

* **Two’s complement Representation**

In the two’s complement representation, the leftmost bit is 0 for positive numbers and is 1 for negative number. Negative numbers are stored in their two’s complement form, while positive numbers are stored as it is. Consider again representation for + 1210 and -1210 in an eight-bit format using the two’s complement representation.

1 210 = 0 0 0 0 1 10 02

-1210 = 1 1 1 1 0 0 1 12

The negative number is obtained by simply adding 1 to the one’s complement notation, which corresponds to the one’s complement bit pattern for +11 : (-12+1) 10 = -1110 = 111101002. There in only one representation of for zero in this format which is 00000000, as tow’s complement of 00000000 is 00000000 itself. Since there is only one representation for zero, all bit patterns are valid and there are 28 =256 different number (from -128 to +128) that can be represented using this format.

There is an equal number of positive and negative numbers. Zero is considered to be a positive number because is sign bit is 0. The positive-numbers start at 0, but negative number starts at -1, and so the magnitude of the most negative number is one greater than the magnitude of the most positive number. The positive number with the largest magnitude is +127, and the negative number with largest magnitude is -128. There is thus no positive number that can be represented that corresponds to the negative of -128. If we try to find the two’s complement negative of -128, we’ll get -128 itself.

Two’s complement representation is common in conventional computers

**Examples:**

1.Find 1’s & 2’s complement of 1101.11

**Solution:** 1’s complement: 0010.00 2’scomplement: 0010.01

2.Find 10’s complement of decimal no. 32165.13

**Solution:** 9’s complement 67834.87 10’s complement 67834.88(adding 1 to the LSB)

* **Addition/Subtraction using One’s Complement Notation:**

If a number Y is to be subtraction form X, it is equivalent to adding –Y to +X. in one’s complement notation –Y will b represented by its one’s complement. Therefore subtraction operation is replaced by addition of complement. If Y is to be added to X then that is addition itself. To both the cases we are performing addition only. This is the main reason why complement notation is used, no separate electronic circuit required for subtraction. In one’s complement arithmetic, if a carry comes out of the most significant while adding two numbers, then it is to be added to the LSB to the result.

**Example:** Take 4 bit computer

Adding of carry to the LSD of result is called end round carry. If there is a carry out of MSB result is positive. Else result is a negative number.

* **Addition/Subtraction using Two’s Complement Notation**

When positive number are added the situation is identical to the one discussed for 1’s complement notation when one or both of the numbers are negative then the rule is to add two numbers and ignore the carry out of MSD. However a carry out of MSB indicates that the result is positive, which otherwise is negative.

**Example:** take 4 bit computer.

**Overflow and Representation of Negative Number in computer**

Number are stored in uniform fashion inside computer, using fixed number of bits, i.e. all the number are stored in same fixed number of bits. Suppose that a computer system uses 1 byte (8bits) to represent integers, than in can store binary equivalent of all the decimal number of 0 to 28 -1 (from 000000000 to 11111111). If there are m bits, then rang will be from 0 to 2m -1. This method of representing the non negative integers is just conversion from decimal to binary. It is called the **Binary value Coding (BVC).** We can add two fixed length BVC integers, but at time, the sum can get too big fit into the given amount of storage available. For example when adding 1 to 255, the answer is 256 in decimal, but if only 8 bits are available, then we have a problem in binary.

|  |  |
| --- | --- |
| 255  +1  256 | 11111111  +00000000  1)00000000 |

The 1 at 9th bit position is called the carry bit. Answer, in BVC (8 bit) is ZERO, clearly wrong. This is called overflow for BVC numbers, when the answer doesn’t fit into the fixed length. Overflow for BVC number also happens when you try to subtract a larger number form a smaller one-you need to borrow into the most significant bit: ambiguity of result in later case is because the answer, in this case should be negative, but there is no way in BVC to represent negative numbers. Up to this point we have considered only unsigned number, but we need to represent signed numbers as well. Following the methods for representing signed numbers in computer.

* **Signed magnitude Representation.**

The signed magnitude (also referred to as sign and magnitude) representation is most simple. In decimal number system, a plus or minus sigh to the left of a number indicated whether the number is positive of negative as in +12 and -12. In the signed magnitude representation the leftmost bit is used for the sign, which takes on a value of 0 and 1 for ‘+’ and ‘-’ respectively. The remaining bit contains the absolute magnitude. Consider representation for +1210 and -1210 in an eight bits magnitude format:

+1210=000011002

-1210=100011002



Sinn bit

Simply changing the sign bit in the positive number from 0 to 1 from the negative number of equal magnitude. Notice that there are both positive and representation for zero viz. 00000000 and 10000000. There are eight bits in the example format, with which 28=256 different patterns are possible, but only 28\_1=256 different number cab be represented (ranging from-127 to +127), since +0 and -0 represent the same number. It is difficult to perform arithmetic using this representation, because sign bit it need to be taken into consideration.

**BINARY CODES**

Most of the compute doesn’t use the pure form of binary number system, several coded versions have been devised to store digit. Alphabets and special characters. Coding is different form conversion, in coding each digit (also alphabets & special characters in case of alphanumeric coding) is assigned a unique code and codes for individual digits, appearing in the number are stored, unlike the binary equivalent of the number, which is stored in case of conversions.

Note :

* **BCD**- Binary Coded Decimals.
* **ASCII**- American Standard Code for Information Interchange.
* **ISCII**- Indian standard Code for Information Interchange.
* **EBCIKC**-Extended Binary Coded Decimal Interchange Code
* **UNICODE**- Used by Java Language.

To assign unique codes to all the ten decimal digits, at lasts four bits are needed, therefore all numeric codes assign unique 4- bit binary codes to each decimal digit. Now an ordered pair of 10 can be selected, form 16, in approximately 30 billion ways.

Therefore these many numeric codes are possible. All of there can be further divided into Weighted and Now=Weighted codes.

If weights are allotted to each of the 4 position, then the code is said to be weighted, else non-weighted.

**Example**

In 2421 weights assigned to the position from left, are respectively 2, 4, 2 and 1. In 8421code, weights are 8 (2)3 ,4(22),2(21) and 1 (20), which are standard binary weights, 8421 is also called Binary Coded Decimal Code or BCD. Weights can also be assertive, as in the case of 8421, where weight are respectively 8, 4,-2 and -1. In Non-Weighted code, codes are allotted following a

certain pattern as in Excess-3 and Gray code. Codes of all the digits in each of the number code are listed below.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Decimal digit** | BCD (8421) | 8421 | 2421 | 5211 | Excess-III | Gray |
| 0 | 0000 | 0000 | 0000 | 0000 | 0011 | 0000 |
| 1 | 0001 | 0111 | 0001 | 0001 | 0100 | 0001 |
| 2 | 0010 | 0110 | 0010 | 0011 | 0101 | 0110 |
| 3 | 0011 | 0101 | 0011 | 0101 | 0110 | 0110 |
| 4 | 0100 | 0100 | 0100 | 0111 | 0111 | 0111 |
| 5 | 0101 | 1011 | 1011 | 1000 | 1000 | 0111 |
| 6 | 0110 | 1010 | 1100 | 1010 | 1001 | 0101 |
| 7 | 0111 | 1001 | 1101 | 1100 | 1010 | 0100 |
| 8 | 1000 | 1000 | 1110 | 1110 | 1011 | 1100 |
| 9 | 1001 | 1111 | 1111 | 1111 | 1100 | 1101 |

Gray code exhibits only a single bit change form one code number to next code.

**Self-Complementing Property of a code**

If on complementing the code of any digit d we get the code of digit-9-d then the code is said to possess self complementing property, and it is called a **self-complementing code.** For example 8421, 2421, 5211 and access-3 are self complementing codes.

Sufficient condition for a weighted code to be Self-Complementing is that sum of all weight must be 9. However non-weighted codes are self –complementing. (EXCESS-3), thus given condition is not the necessary condition.

**Encoding**

To encode any decimal number, write code corresponding to each digit, e,g. if we encode decimal number 89721 in BCD then we write 4-bit code of each digit of 89721

8 9 7 2 1

1000 1001 0111 0010 0001 ← BCD codes of corresponding digit

(89721)10 = 1000 1001 0111 0010 0001 in BCD

=1011 1100 1010 0101 0100 in Exccss-3 Code

* Encoding requires more space then direct binary conversion.
* Conversion is more time consuming as it requires performing sequence of division and multiplication while encoding is simply table look up.

**Converting from Binary to Gray and Vice-verse**

Given an n digit number. Let bi and gi denote ith digit, from right of binary and gray code then.

|  |  |
| --- | --- |
| **Binary to Gray:** | **Gray to Binary:** |
| bn **=** gn | gn = bn |
| Bi =gi + bi-1 | gi = bi + bi-1 1,2,3,…….n-1 |

**Addition of number in BCD**

Follow the give procedure to add tow number given in BCD

* Add corresponding digits using rules of binary addition
* If the 4 bit sum of any digit is greater than 9 or a carry generated out of a group, then all 0110(decimal 6) to the result of that group.

**Example:-** In decimal In BCD

24 00100100

+25 +00100101

49 01001001

49=49Correct

1 1 carryout of the group

18 00011000

+39 00111001

57 5 1 =57 Wrong result, because carry was generated out

of this group. Therefore

add 6 to get the correct result

01010001

0110 Adding 6 (0110)

01010111 = 57 Correct Result.

**Addition of numbers Excess-code**

X is corresponding digits

O is carry out of the group is generated fo if the 4-bit sum is any of 0000,00001,0010 then add 0011 to that group otherwise subtract 0011 from that group. For example

In decimal In xs-3

2 4 0 1 0 1 0 1 1 1

+ 2 5 +0 1 0 1 1 0 0 0

49 1 0 1 0 1 1 1 1

-0 0 1 1-0 0 1 1 subtraction 6 from each group (no carry)

0 1 1 1 1 1 0 0=49 (in xs-3)

**Example:**

1. Express the sum of10+14 in Gray Code and BCD Code

**Solution :**  10 + 14 = 24

1

= 00110110 in gray code.

=00100100 in BCD.

Therefore answers are 001101 and 00100100 respectively.

2. how many bits one need to encode 125 characters.

**Solution:** 7. With 6 bit, only 26 =64 character can be assignee unique codes therefore we need 7 bits, with which 128 unique

codes can be generated.

3. what is the largest number which can be strode in memory of 24 bits, if Excess-3 coding is used.

**Solution:** 24 can be divided in 6 groups of 4 bits each. Now 4-bit are required to encode each decimal digit and maximum decimal digit is9. Therefore, maximum number is 99999.

4. what is the answer of above question if binary conversion used.

**Solution:** 224-1, maximum number 11111………111 a sequence of 24 I’s.

5. how many characters are coded in Unicode.

**Solution:** Since Unicode provide unique to bit code to each character thus 216 characters can be assigned codes.

6. how may character can be assigned codes if a code is formed which use 9 bits.

**Solution:** 29, 29 unique combinations are possible of 9 bits for each combination can be a code.

7. what is the result of 01111001 + 01100100 If both are given in Excess-3.

**Solution:**  0 1 1 1 1 0 0 1

0 1 1 0 0 1 0 0

1 1 0 1 1 1 0 1

-0 0 1 1 -0 0 1 1 No carry was generated subtract 0011 from each group.

1. 0 1 0 1 0 1 0 =(77)10 Answer

8. Which of these in not a self complimenting code.

(a)8422 (b) 8421 (c) 5211 (d)2421

BOOLEAN ALGEBRA 6

**Boolean Algebra :-** is an algebra of logic, which aim at analysis and design of logic circuits. It is named after George Boole who developed in 1854. It is also used to simplify logical statements and solve logic problems. Consider the statement “He is wise”.

The statement can be either true of false. Such statement, which can be either true of false, are called **logical statement.** Let us assign a symbol to this statement, say X. further. 1 is used represent true, and 0 represent false. If the above mentioned statement is true, we write X=1, else if it is false, we write X=0. Here 0 and 1 have no asthmatic significance but logical. Since 0 (or false) and 1(or true) are constant, they are called **Boolean Constants.**  X is a variable that can take its value only form the set of Boolean constants, X is called a Boolean Variable

**Boolean operator**

The operators with which Boolean variables and/or constants are connected are called Boolean (or logical) operators. here are three such operators namely, AND, OR and NOT also represented symbolically as,. **,+ , ~!,**

* **AND (.)**

Consider X = He is tall Y = He is wise.

The compound statement “He is tall AND He is wise” can be written Symbolically as X ANN Y or X,Y let us list all the possible combinations of X and Y.

|  |  |  |  |
| --- | --- | --- | --- |
| **X** | **Y** | **X AND Y** | A table which list all possible combination of  variables is called Truth Table |
| 0(false)  0(false)  1(true)  1(true) | 0(false)  1(true)  0(false)  1(true) | 0(false)  0(false)  0(false)  1(true) |

Form Truth Table -X. Y is true X and Y are 1.

* **OR (+)**

The compound statement “He is tall OR He is wise” can be represented symbolically as X OR Y or X +Y Truth table of OR.

|  |  |  |
| --- | --- | --- |
| **X** | **Y** | **X + y** |
| 0  0  1  1 | 0  1  0  1 | 0  1  1  1 |

i.e. OOR Y is true if either of X or Y or both are true.

* **NOT (~ or !)**

If x = “He is wise” is any statement. Then NOT X,!X, or ~X= “He is NOT wise”.

**Not:- !X** This doesn’t mean he is dull, it just negates the statement X. Truth Table for **NOT**

|  |  |
| --- | --- |
| **X**  **0**  **1** | **X**  **1**  **0** |

From truth table it is clear that X=X.0.

**Boolean Expression:-**

Boolean Expression is an expression involving Boolean constants and/or Boolean variables connected together with Boolean operators. Solution of Boolean expression is again from the domain {true, false}.

e.g. x + y. 0+1 is Boolean expression

if x=0, y=1. Then above expression is 0+1.0+1.=0+0+1 i.e. true.

**Operator Precedence: NOT>AND>OR**

**Boolean Function**

A Boolean function expresses the dependency to a Boolean quantity on a number of Boolean variables in the form of a Boolean expression. For example: f (A,B) = A,B + A,B + A.

* Value of a Boolean function can be either true of false.
* It is also called Switching Function. While dealing with circuits.

**Evaluating Boolean expression (using Truth Table)**

e.g. draw truth table for F=A.B-A.B-A

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **A** | **B** | **A + B** | **A.B** | **A** | **A.B** | **A.B+AB** | **F** |
| **0** | **0** | **0** | **0** | **1** | **0** | **0** | **0** |
| **0** | **1** | **1** | **0** | **1** | **1** | **1** | **1** |
| **1** | **0** | **1** | **0** | **0** | **0** | **0** | **1** |
| **1** | **1** | **1** | **1** | **0** | **0** | **1** | **1** |

* Since column corresponding to A + B and F are identical therefore A + B are said to be logically equivalent. We can write say that F simplifies to A + B or F= A + B.
* To draw truth we list all possible combinations of all variables present in the expression, and the value of expression corresponding to each combination

**Boolean Postulates**

Fundamental conditions or self evident propositions are called Postulates. Theorems of Boolean algebra are derived form and are Proved using these Postulates. Table below lost all of them.

**Column-1 Column-2**

**Derived from AND Operation Derived from OR Operation**

1. 0.0 = 0 6. 1 + 1 = 1

2. 0.1 = 0 7. 1 + 0 =1

3. 1.0 = 0 8. 0 + 1 =1

4. 1.1 = 1 9. 0 + 0 = 0

5. 0 = 1→derived from NOT Operation 10. 1 = 0→derived from NOT

If we examine the two column above, column II is obtained from I by interchanging 0’s & 1’s and +’s &’s. such expression which are obtained by interchanging ‘0’ & ‘1’ and ‘+’ ‘,’ are called Duals.

**Example:**

Dual of 1.x+y.z+0. Is(y + z),1

‘,’ signs are interchanged with ‘+’ and 1’s are interchanged with 0’s

**Duality Principle of Boolean Algebra**

If any equation is true is Boolean Algebra, then the dual of that the dual of that equation is also true. This is called principle of Duality.

**Theorems of Boolean algebra**

|  |  |  |
| --- | --- | --- |
| **Name of Theorem** | **Original Form** | **Dual Form** |
|  | **0.x=0** | **1+x=1** |
|  | **1.x=x** | **0+x=x** |
| Idempotent law | **x.x=x** | **X+x=x** |
| Commutative law | **X + y = y + x** | **X .y=y .x** |
| Distributive law | **x.(y+z)=x. y+x.z** | **X+y.z=(x+y).(x+z)** |
| Associative law | **X+(y+z)=(x+y)+z** | **x.(y.z)=x.y).z** |
| Absorption law(1st ) | **X+x.y=x** | **x.(x+y)=x** |
| Absorption law(2nd ) | **X+x.y=x+y** | **x.(x+y)=x.y** |
| Absorption law(3nd ) | **Xy+xz+yz=xy+xz(x+y)** | **(x+z)(y+z)=(x+y)(x+z)** |

Like we have theorems in ordinary algebra, we also have in Boolean Algebra.(can be verified using truth

Demerger’s Law x+y=x.y \_ \_ x.y=x+y

Generalized Demerger’s Law: x+y+z+…….=x.y.z………………x+y+z

**Simplification of Boolean Expression:**

* Use distributive property, take the common but, if any and use the theorems on the part left inside the bracket. For example:

Xy z + xyz w=y z (x+xw)=yzx using 1st absorption law

Or xyz(1+w)=yzx because 1+x=1

* If any term does not contain a variable say z. then take the ‘AND’ of that term with (z+z)=1. For e.g. xz + xy + yz = xz + xy + yz (x + x) = xz + xyz + xyz = zx + xy.

|  |  |
| --- | --- |
| **Example Simplify**  1. (x + y) (x + z) (y + z)  2. xy + xz + yzw  3. A + B +CD  4. ABC + ABC + ABC  5. xy + xy + xy+xyz + xyz | **Answer**  **(x + y).(x + z)**  **Xy + yz zw + xz**  **(A + B) . (C + D)**  Connot be simplicied further  X + y |

in example 4 above, all the three variable are present in each of four Products (calling AND operation Product). Such expression in which all the variables (either complemented or otherwise) are connected with AND operation in each term and all terms are connected with OR operator, are said to be expression in **sop sum of Product term.** Each term of SOP form is called minterm. The dual of SOP is **POS (Product of sums)** and Dual of minterm is a maxterm.

**Example: (**x,y,z**)=** xy is not in SOP form because variable z is not present in the product. To convert it is SOP form multiply the term with (z+z)=1

F(x,y,z)=xyz+xy,z Now both terms are minterm and f is in SOP form.

**IMPLEMENTATIONS OF BOOLEAN ALGERA IN COMPUTER**

**Logic circuits**

Logic Circuits are used to implement Boolean Algebra in computer, they use **logic gate as fundamental** element in circuit. Following table list all the gates available and the corresponding function.

|  |  |  |  |
| --- | --- | --- | --- |
| **Logical Operation** | **Symbol** | Gate | Output |
| **NOT** | **~,-,!** | A | A |
| **AND** | **./^** | A  B | A.B |
| **OR** | **+/^** | A  B |  |
| **NAND (NOT+NOT)** |  | A  B | A.B=A.B/A .B |
| **NOR (NOT + OR)** |  | A  B | **A+B=A.B/A** |
| **XOR** |  | A  B | **AB/AB(A\*B)**  **(A+B). (A+B)=AB+A.B** |
| **XNOR** | **/** | A  B | **AB/AB**  **(A+B).(A+B)=A B+A.B** |

**Truth table** for these gates is given blow:

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| A | B |  | + |  |  |  |  | A |
| 0 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 1 |
| 0 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 1 |
| 1 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 |
| 1 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 |

A=X1 + X2 + X3+……….. A=1 when odd number of variables (X1 ‘s) are 1

A=X1 X X2 X X1 X ……… A=1 when even number of variables (X1 ‘s) are zero

A=X1 +X1+ X1 + ……… Xn A=1 if Xi =1vi if

A=X1 +X2 + ……… +Xn A=0 if Xi=0 vi

DIGITAL CIRCUITS 7

**BOMBINATIONAL CIRCUITS**

**Adders**

Adders are the basic building blocks of all arithmetic circuits: adders add two binary numbers and give our sum and carry as output. Basically we have two types of adders.

* **Half Adders**

Adding two single-bit binary values X. Y produces a sum S bit and a carry out C-out bit. This operation is called half addition and the circuit to realize it is called a half adder.

* **Full adder:**

Full adder takes a three-bit input. Adding two single-bit binary values X,Y with a carry input bit C-in produce a sum hit S and carry out C-out bit.

* **Subtract**

Subtracted circuits take two binary numbers as input and subtract one binary number input from the other binary number input. Similar to adders, it gives out two output difference and borrows (carry-in the case of Adder). There are two types of subchapters.

* **Half Subtract**

the half-subtracted is a combinational circuit which is used to perform subtraction of two bits. It has two input. X (minuend) and Y (subtrahed) and two output d (difference) and B (borrow).

* **Full Subtract**

A full subtracted is a s combinational circuit that perform subtraction involving three bits, namely minuend. Subtrahend, and borrow-in.

* **Encoder**

An encoder is a device used to change a single (such as a bit stream) of data into a code. The code may serve any of a number of purposes such as compressing information for transmission of storage, encrypting or adding redundancies to the input code, or translating from one code to another. This is usually done by manes of a programmed algorithm, especially if any part is digital. While most analog encoding is done with analog circuitry.

* **Decoder**

A decoder is a device which does the reverse of an encode, undoing the encoding so that the original information can be retrieved. The same method used to encode is usually just reversed in order to decade.

* **Multiplexer**

A multiplexer or mux (occasionally the term muldex is also found, for a combination multiplexer demultiplexer) is a device that selects one of many data-sources and output that source into a single channel.

* **Demultiplexer**

A demultiplexer (or demux) is a device taking a single input that selects one of many data-output-lines and connects the single input to the selected output line. A multiplexer is often used with a complementary demultiplexer on the receiving end.

**Flip Flop**

In digital circuits, the flip-flop, lath, or bistable multivibrator is an electronic circuit which has tow stable states and thereby is capable of storing on bit of memory. A flip-flop is controlled by one or two control signals and/or a gate or clock signal. The output often includes the complement as normal output.

* **Types of Flip-flop**

All flip-flop can be divided into four basic types: SR,JD, D and T. they differ n the number of inputs and in the response invoked by difference value of input signals. The four types of flip-flops are defined in table.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **FLIP-FLOP** NAME | **FLIP-FLOP SYMBOL** | **CHARACTERISTIC** | | | **CHARACTERISTIC EXUATION** |
| SR | S Q  CLK  R Q | S  0  0  1  1 | R  0  1  0  1 | Q(NEXT)  Q  0  1  ? | Q(next)=S+R’Q SR=0 |
| JK | J Q  CLK  K Q | J  0  0  1  1 | K  0  1  0  1 | Q (next)  Q  0  1  Q2 | Q(next)=JQ’ + K’Q |
| D | D Q  CLK Q | D  0  1 |  | Q (next)  0  1 | Q (next)=D |
| T | T Q  CLK Q | T  0  1 |  | Q (next)  Q  Q 1 | Q (next)=TQ’ +T’Q |

Each of these flip-flops can be uniquely described by its graphical symbol, its characteristic table, its characteristic equation or excitation table. All flip-flops have output signals Q and Q1 .

The characteristic table in the column to Table defines the state of each flip-flop as a function of its input and pervious state. Q refers to the present state and Q (next) refers to the next state after the occurrence of the clock pulse.

**SR flip flop:** the most fundamental flip flop is the SR flip-flop, where S and R stand for set and reset. In can be constructed form a pair of cross-coupled NOR (negative OR) logic gates. The stored bits is present on the on the output when marked Q. the characteristic table for the SR flip-flop shows that the next state is equal to the present stat flip-flop output S and R =1, the next clock pulse clears the flip-flop. When S=1, the flip-flop output Q is set to 1. The equation mark (?) for the next state when S and R are both equal to 1designates and indeterminate next state.

**JK flip-flop**: the characteristic table for the JK’ flip-flop is the same that of the RS when J and k are replaced by S and R respectively, except for the indeterminate case. When both J and K are equal to 1, the next state is equal to the complement of the present state, that is, Q (next)=Q1 . the characteristic equation of the JK flip-flop is Q next =JQ+KQ.

**D flip-flop:** the D flip flop cab be interpreted as primitive delay line or zero-order hold, since the date is posted at the output on clock cycle after it arrives at the input. It is called delay flip flop since the output takes the value in the date-in. the characteristic equation of the D flip-flop is: Qnext=D. the next state of the D flip-flop is completely dependent of the input D and independent of the present state.

**Toggle flip-flop (T flip-flop):** If the T input is high, T flip-flop changes state (“toggles”) whenever the clock input is strobe. If the T input is low, the flip-flop holds the previous value. This behavior is described by the characteristic equation Qnext=T+Q (or, without benefit to the XOR operator, the equivalent: Qnext=TQ+TQ. The next state for the T flip-flop is the same as the present state Q if T 0 and complemented if T=1. Uses

* A single flip-flop can be used to store on bit, or binary digit, of date.
* Static RAM, which is the primary type of memory used in registers to store numbers is computers and in many caches, built out of flip-flop.
* Any one of the flip-flop types can be used to build any of the others. The data contained in several such flip-flop may represent the sate of sequencer, the value of canters, and ASCII character in a computer’s memory or any other piece of information.
* The T flip-flop is useful for construction various types of canters repeated signals to the clock input will cause the flip-flop to change state once per high-to-low transition of the clock input, if its T impute is “1”. The output form one flip-flop can be fed to the clock input of a second and so on. The final output of the circuit, considered as the array of output of all individual flip-flop, is a count, in binary, of the number of cycles of the first clock input, up to a maximum of 2n -1. Where n is the number of flip-flops use

**Counter:**

**A** sequential circuit that goes througha prescribed sequence of states upon the application of input pulses is called a counter. The input pulses, called count pulses, may be clock pulses. In a center, the sequence of states may follow a binary count or any other sequence of stats. Counters are found in almost all equipment containing digital logic. They are used for counting the number of occurrences of an even and are useful for generating timing senesces to control operation in digital system.

Of the various sequences a counter may follow, the straight binary sequence it the simplest and most strength forward . counter the follows the binary sequence is called a binary. An n-bit binary counter consists of n flip-flops and can count in binary form 0 to 2n -1.

**Register**

A register is a sequential circuit with n+1 (not counting the clock) input and n output. To each of the outputs corresponds an input. The first n input will be called x0 trough xn and the last input will be called Id (for load). The n outputs will be called yn trough yn-1 .when the Id input is 0. The output are unaffected by and clock transition, making the y output into copies of the x inputs before the clock transition.

* **Categories of Registers**

Registers are normally measured by the number of bits they can hold, for example, an “8-bit register” or “32-bit register. Registers are now usually implemented as a register file, but they have also been implemented using individual flip-flop, high speed core memory, thin film memory, and other ways in various machines. There are several classes of register according to the content:

* Data register are used to store integer number (see also Floating Point Register, below). In some older and simple current CPUs, a special data register is the accumulator, used implicitly form many operation.
* Address registers hold memory address and are used to access memory. Income CPUs, a special address register is an index register, although often these hold number used to modify addresses rather than holding addresses.
* Conditional register hold truth values often used to determine whether some instruction should or should not be executed.
* General purpose registers (GPRs) can store both data and addresses. i.e. they are combined Data/Address registers.
* Floating point registers (FPRs are used to store floating point numbers in many architectures.
* Constant register hold real-only value (e.g. zero, one, pi.)
* Vector register hold data for vector processing done by SIMD instruction (Single instruction multiple data).
* Special purpose register hold program state: they usually include the program center (aka instruction pointer). Stack pointer and status register (aka processor status word).
* Instruction register store the instruction currently being executed.
* Index register are used for modifying operand address during the run of a program.
* In some architectures. Model specific registers (also called machine-specific register) store data and setting related to the processor itself. Because their meanings are attached to the design of a specific processor, they cannot be expected to remain standard between processor generations.
* Register related to fetching information from random access memory, a collection of storage register located on separate chips from the CPU (unlike most of the above, these are generally not architectural register):
* Memory buffer register Memory data register Memory Types Range Register.
* Hardware register and similar, but occur outside CPUs.

**PRICITCE EXERCISE-1**

**1. The number of significant digits in 23400.100 is.**

(a) 6 (b) 7 (c) 8 (d) none

**2. The number of significant digits in 001.100 is.**

(a) 6 (b) 4 (c) 2 (d) none

**3. A distance of 2.093 km is rounded off to three significant digits. The total round off error is,**

(a) -3m (b) 3m (c) 30m (d) none

**4. The round of error when the number 8.987652 is rounded of to 5 significant digits is.**

(a) 0.00048 (b) -0.00048

(c)-0.000048 (d) none of

**5. In general of ratio of round off error to truncation error in magnitude is**

(a) 1:1 (b) 1:2 (c) 2:1 (d) none

**6. When the number is rounded off to k decimal digits, the magnitude of the limit of relative error is.**

(a) 101+k (b) 101+k

(c) 0.5\*101+k (d) 0.5\*101+k

**7. Mark the incorrect statement.**

(a) Truncation error is always positive in case of positive number

(b) Truncation error is always negative in case of negative number

(c) Round off error may be positive or negative

(d) None of the above

**8. What is the base Roman Number system**

(a) 0 (b) ∞

(c) Not defined (d) variable

**9. Given a Roman Number XVII, which is the most Significant Digit?**

(a) X (b) 1 (c) V (d) none

**10. The number of bits in the binary representation of the decimal number 16 is**

(a) 3 (b) 4 (c) 5 (d) 6

**11. A binary number with n digits, all of which are 1’s has the value.**

(a) n2-1 (b) 2n (c) 2n-1 (d) n2-1

**12. The fraction 0.6810 is equal to**

(a) 0.0101012 (b) 01012

(c) 0.101012 (d) none of these

**13. In the binary number 101.101 fractional parts has value**

(a) 0125 (b) 0625 (c) 0875 (d) 0.5

**14. The binary number representation of decimal number 39 is**

(a) 100111 (b) 1000111

(c) 1001111 (d) 101011

**15. The binary fraction 0.0111 in decimal form is equal to**

(a) 0.4375 (b) 0.6225

(c) 0.875 (d) 0.8325

**16. Decimal number 149 in Octal as**

(a) 105 (b) 178 (c) 254 (d) 225

**17. The value of 25 in octal system is**

(a) 40 (b) 50 (c) 200 (d) 400

**18. The binary representation of hexadecimal number C3 is.**

(a) 111 (b) 110011

(c) 111100 (d) 11000011

**19. The decimal 1024 in binary is**

(a) 10000000 (b) 1000000000

(c) 100000000000 (d) none of these

**20. The decimal equivalent of the octal number 236.2 is**

(a) 158.25 (b) 201.25

(c) 136.25 (d) none

**21. The hexadecimal number 9F is equivalent to binary numeral.**

(a) 1001110 (b) 11011111

(c) 10111111 (d) none of these

**22. 0.310 is equivalent to**

(a) 0.100110011001 (b) 0.110011001001

(c) 0.010011001001 (d) none of these

**23. 1420.812510 is equivalent to**

(a) 1101100010.10112

(b) 10110001100.11012

(c) 1001110010.10112

(d) 1000100100.00112

**24. 1025.2510 in base 2 is equal to**

(a) 1000000000.01

(b) 10000000000001.01

(c) 1000000001.01

(d) 100010001001.01

**25. The decimal number for the code 0111111112 is**

(a) 255 (b) 377 (c) 511 (d) 777

**26. The decimal equivalent of 1010101010.1012 is**

(a) 1364.625 (b) 628.625

(c) 1262.6 (d) none of these

**27. 11101012 is equal to base 8**

(a) 117 (b) 165 (c) 234 (d) 724

**28. 001011011.1001112 is based 8 is equal to**

(a) 130.115 (b) 133.534

(c) 134.534 (d) 135.127

**29. 39.12510 is equal to in base 4.s**

(a) 129.13 (b) 213.020

(c) 213.01 (d) 312.02

**30. The hexadecimal number 7563 is equivalent to binary number.**

(a) 0111010101100011

(b) 10010011110010011

(c) 1110101011000110

(d) 0111110110110101

**31. 3D8.D616 is equivalent to binary number.**

(a) 011011000.1101011

(b) 01111011000.110011

(c) 1111001000.1100011

(d) none of these

**32. What is AF.16C10 is base 8**

(a) 536.554 (b) 454.054

(c) 267.115 (d) 257.0554

**33. 3CB.9816 in base 2 is equal.**

(a) 111001011.1011

(b) 110011100101.1001

(c) 001111001011.10011

(d) 01110011011.1001100

**34. 1100001000111010010010112 is equal to x16. The value of x is.**

(a) B24C3C (b) B22B3A

(C) C25B51 (d) C23A4B

**35. IFF 16 is equivalent to decimal**

(a) 276 (b) 511

(C) 777 (d) 111111111

**36. The hexadecimal number of the binary number 011011100.101010 is**

(a) E5.20 (b) DC.A8

(C) ED.42 (d) 37.2A

**37. If 2048.62510 =x2 then X is**

(a) 10000000000.101

(b) 1000000000000.101

(C) 100000000000.101

(d) none of these.

**38. 10110001100.11012 =x10 value of x is.**

(a) 1420.8125 (b) 1421.625

(C) 2614.66 (d) none of these.

**39. The value of x in the expression 65410=x8 is.**

(a) 1213 (b) 1214 (C) 1216 (d) none

**40. The value of x in expression (23) x = (19) 10 is.**

(a) 6 (b) 8 (C) 12 (d) none

**41. The value of x in the expression 16264 x = 7348 10 is**

(a) 4 (b) 8 (C) 16 (d) 32

**42. 810 = x8 = y16 then X.Y in decimal system is.**

(a) 64 (b) 80 (C) 132 (d) none

**43. If 2410=X8=Y16 then X/Y is.**

(a) 2.0 (b) 1.0 (C) 0.5 (d) none

**44. If x8 +y16 = 120 and x8 -y16 =5012 then value of x is**

(a) 132 (b) 1E (C) 264 (d) none

**45. if =4/5 then x/y is**

(a) 2 (b) 0.25 (C) 0.4 (d) none

**46. if (0.6)x.(0.8) y=1210 then x.y is.**

(a) 8 (b) 6 (C) 6 (d) none

**47. When an even decimal number is converted into the binary number system, the least significant digits is**

(a) 1 (b) 0

(C) 0 or1 (d) cannot be found.

**48. If 0 denotes that LED is on (binary1) and the dark circle ‘•’ denotes that LED is off (binary 0) what is the decimal equivalent of the binary number displayed?**

(a) 100 (b) 83 (C) 144 (d) 172.

**49. A=5bit register stores “Low High low High” what is the decimal value to the number stored.**

(a) 8 (b) 9 (C) 10 (d) 11.

**50. Consider base 32 number system with 32 different symbols as 0,1,2…9 A,B,C…..What is the binary equivalence of (2AV.UI)32 .**

(a) 0100101011111.111101

(b) 100101001111.111101

(c) 10010011111.111101

(d) none of these

**51. 49.2510 in BCD code is equal to.**

(a) 110001.01

(b) 01001001.00100101

(c) 10010011111.111101

(d) none of these

**52. 0011011110010010 in BCD code represents the decimal number.**

(a) 3592 (b) 3752 (c) 3792 (d) none.

**53. (79)10  when added to (97)10 in BCD, the result is.**

(a) 00011110110 (b) 000101110110

(c) 000100010000 (d) none of these.

**54. 9 When added to 9 in BCD, the result is.**

(a) 00011000 (b) 1100

(c) 10100 (d) none of these.

**55. Winch of the following code is a weighted code?**

(a) Eecess-3 (b) BCD code

(c) Gray (d) none of these.

**56. Which to following is a non-weighted code**

(a) 8421 (b) 2421

(c) Excess-3 code (d) 2221 code.

**57. The decimal number 85 in encoded as 11000101 in.**

(a) 8421 code (b) 2421 code

(c) 4421 code (d) 2221 code.

**58. The Excess-3 code for 45 is -3 code is**

(a) 01000101 (b) 01110101

(c) 01111000 (d) 01001000

**59. The Excess-3 code for 9 is**

(a) 0110 (b) 1100 (c) 1001 (d) none

**60. In order to get correct answer when tow number’s are added in excess-3 code and sum is less than or equal to 9 it is ecessary to**

(a) Subtract 0011 from them sum

(b) add 0011 to the sum

(c) Add 0110 to the sum

(d) Subtract 0110 from the sum.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1** | **C** | **2** | **D** | **3** | **B** | **4** | **C** | **5** | **B** | **6** | **D** | **7** | **D** |
| **8** | **C** | **9** | **D** | **10** | **C** | **11** | **D** | **12** | **D** | **13** | **B** | **14** | **a** |
| **15** | **A** | **16** | **D** | **17** | **A** | **18** | **D** | **19** | **B** | **20** | **A** | **21** | **D** |
| **22** | **D** | **23** | **B** | **24** | **A** | **25** | **A** | **26** | **B** | **27** | **B** | **28** | **B** |
| **29** | **B** | **30** | **A** | **31** | **B** | **32** | **D** | **33** | **C** | **34** | **D** | **35** | **B** |
| **36** | **B** | **37** | **C** | **38** | **A** | **39** | **C** | **40** | **B** | **41** | **B** | **42** | **A** |
| **43** | **B** | **44** | **A** | **45** | **A** | **46** | **A** | **47** | **B** | **48** | **B** | **49** | **D** |
| **50** | **A** | **51** | **B** | **52** | **C** | **53** | **B** | **54** | **A** | **55** | **B** | **56** | **C** |
| **57** | **C** | **58** | **C** | **59** | **B** | **60** | **a** |  |  |  |  |  |  |

ALGORITHMS AND FLOWCHART 8

**ALOGRITHMS AND FLOWCHART**

Algorithms and flowchart are the basic building block of developing a program. This section aims at introduction you to flowchart and emphasizing and on algorithms. It contains detail exposition on algorithms and also the flowcharts related to them.

**The topics converted in this section are:**

**1. Algorithms:**

* Assignment Statement
* Input/output Statement Operations
* Branching Statements
* Loping Statements
* Arrays

**2. Flow Charts**

* Introduction To Various Symbols
* Interactive And Control Statements

**Algorithm And Flowchart**

A state by sep sequence of instructions required to solve a given problem is called and **Algorithm.** The number of steps in an algorithm is always finite, and each step performs a certain function depending on the type of instructions contained in the step. Following can be the type of instructions or statements.

**Assignment Statement:** Copies the value of expression on R.H.S to the variable on L.H.S. Example X←Y of x=y, copies the contents of Y to X.

**Input / Output Statement**

READ--------for input

READ K will input a value compatible with type of variable k and assign that value to k

PRINT---------for output

PRINT K will print the value of k.

**Branching statements-**

* GOTO step n- transfers the control to nth step. This is unconditional transfer of control.
* Decision making statement transfer the control depending on certain, were also called conditional control transfer statements. Example is II statement.

If (Boolean Expression) THEN

Sub statement

If Boolean expression is true then the following sub-statement may have another form

Statement 1 if(Boolean expression) sub statement

Cond

ELSE True

Statement 2

**Example False**

Statement 1

Statement2

IF(X>0) THEN

PRINT “Positive no”

ELSE

Next Step

PRINT “Non-Positive No”

Prints “Positive No” or “Non-positive No” depending on the value of x

Flow chart for IF-statement

**Looping statement**

These statements execute a given group of statements repeatedly. Following are the looping statements. Which are executed repeatedly, are called Body of the loop?

**(1.) WHILE LOOP**

WHILE (Condition) **e.g. 1. k=1 (Initialize)**

Body of Loop **2. WHILW (k<5)**

**Next statement a. PRINTK Body of Loop**

**b. K= K + 1**

**output: 1 2 3 4**

Condition is a Boolean expression.

Condition is checked each time, and body of Loop is repeated till it is true Statement is Loop may not be executed even once, if condition is false initially

**(2) DO WHILE**

**DO e.g. 1. k=1 (Initialize)**

**Body of Loop 2. DO (k<5)**

**WHILE (Condition) a. PRINT K Body of Loop**

**b. K= K + 1**

**WHILE (K-5)**

**Output: 1 2 3 4**

Identical to WHILE LOOP except, here condition is checked at the edit of Loop. Body of Loop always gets executed at least once.

(3) **REPLACE UNTIL**

REPEAT e.g. 1. k=1 (Initialize)

Body of Loop 2. REPET

UNTIL (Condition) a. PRINT K Body of Loop

b. K= K + 1

UNTIL (K>5)

**Output: 1 2 3 4 5**

Repeat the Body of loop until the Condition becomes true or as long it is false. Loop is executed at least once.

**(4) FOR LOOP**

**FOR** Counter = First \_ value **To** Last \_ value BY Increment

**<**Body of Loop

Counter is a number which is initialized to First \_ value at the start of loop and is incremented each time by the increment. Loop will be executed till Counter is less than or equal to Last \_ value. Increment part is optional, if not present which is incremented by a fixed value each time.

**Example:**

1. FOR K=1 TO 5 2. FOR K=1 TO 10 BY 2

a. PRINT K a. PRINT K

**Output 1 2 3 4 5 Output 1 3 5 7 9**

1st ↑ or ^ exponent

2nd \*,/,MOD or% multiply, divide, mod (remainder)

3rd +, - Addition & subtraction

4th <,>,<=,>=,<>,= (‘=’ here is logical ‘equal to’)

**Array**

An array is an indexed collection of homogeneous elements, all of same type and referred to by the same name with different

subscripts. **For e.g.**

A [1], A [2], A [3], A [4] etc are all different variable, under the same name A.

FOR i =1 to 4

A [i] = i

FOR I = 1 to 4

PRINT A [i]

**Output: - 1 2 3 4**

**Example**

1. What is the output of following algorithm?

1. a =1,b=1

2. READ n

3. FOR a, b

4. FOR I = 1 TO n-2

i) c = a + b

ii) PRINT c

iii) a = b

iv) b= c

5. RETURN

**Solution:** Given algorithm will print Fibonacci series up to n terms.

2. 1. READ a

2. c=0, d=0

3. WHILE (d<>0)

i. c= c + a

ii. d = d + 1

RETUEN c

Will return

1. a2 (b) c.a (c) 0 (d) none

* **Solution (c)** Loop won’t be executed even once.
* 3.
  + i-1,j=0
  + Repeat
    - j=j+1
    - i=i+3
* Unitl (i>10)
* Value of I immediately after the loop is
* (a) 10 (b) 11 (c) 13 (d) none
* **Solution (c)** Loop will terminate only when I become greater than 10.
  + What will the following algorithm do
* IF A>B THEN
* PRINT A
* ELSE
* PRINT C
* ELSE
* IF B>C THEN

PRINT B

ELSE

PRINT C

**Solution** Print the largest of three number A,B and C.

5. 1. READ data

2. FOR i=1 TO 10

IF A (i)= data THEN

PRINT ‘search successful’

3. PRINT “Search unsuccessful”

**Solution** Searches for data in an array, but “Search unsuccessful” will always be printed

**FLOWCHART**

Flowchart is the pictorial representation of algorithm, through the medium of symbols. A Flow chart consists of characteristically shaped boxes connected by directed line segments. Each box is meant for some specific activity

**Basic Symbols used are listed below:**

|  |  |
| --- | --- |
| **PURPOSE** | **SYMBOL** |
| Start/ Stop |  |
| Input / Output |  |
| Decision box (used in branching) |  |
| Calculation Box |  |
| Connector |  |

**PRACTICE EXERCISE**

**1. Consider the following a algorithm**

1 sum ← 0

2.FOR n ← 1 TO 999 BY 2

(a) sum ← sum + n

End of algorithm

This of algorithm gives mum of

(a) 1, 3, 5, 7…999 (b) 1, 3, 5,….1001

(c) 1,3, 5, 7……997 (d) none of these

**2. In above question what should be the initial value of sum, to sum the series 3,5,7…..999?**

(a) -1 (b) 0 (c) 1 (d) none

**4. Consider the algorithm**

1. L ←P←C←1

2. FOR I←2 TO n

(a) L←P

(b) P←C

(c) P←C+L

End of algorithm what is generated if n=6?

(a) 5 (b) 8 (c) 13 (d) none

**5. Consider the algorithm**

1. L←P←C←1

2. FOR I ← 2 TO n

(a) L←P

(b) P←C

(c) C←P+L

3. RETURN C

What is generated if n=6?

(a) 1,2,3,5,8 (b) 3,5,8,1,3,2,1

(c) 2,2,3,5,8 (d) 2,3,5,8,1,3

**6. Consider the algorithm**

1. X ← 1

2. Y← 0

3. Z← 2

4 FOR i←7 TO BY 2

(a)X←Y

(b)Y←Z

(c)Z←X

(d) P←X-Y+Z

3. RETURN P END OF ALGORITHM

What is the output of the algorithm?

(a) -2,2,-2 (b) -2,2,4

(c) -2,4,-2 (d) none of these

**7. Consider the algorithm**

1. SUM←0

2. I←1 3. REPEAT

(a) SUM←SUM+2\*1

(b) I←1+1

UNIT 1>-11

END OF ALGORITHM

Thus algorithm is used to calculate the sum

(a) 2+4+6..+22 (b) 2+4+6+..+20

(c) 2+4+6+..+18 (d) none of these

**8. Consider the following algorithm**

1. SUM←0

2. INC←0

3. FOR i←1 TO n

(a) FOR j←1 to i

(b) sum ← sum + inc

(c) inc←inc+1

4. RETURN SUM, inc if n=3, what are the values returned by the algorithm

(a) 10,5 (b)15,5 (c)15,6 (d) none

**9. Consider the following algorithm**

1. FOR I←2 TO-12BY-3

(a) print I

End of algorithm

Which series will be printed by this algorithm?

(a) 2 -1 -4 -7 -10 (b) 2 -10 12

(c) 2 0 -2 -4 -6 (d) none of these

**10. Consider the algorithm**

1. F←0

2. FOR I←1 TO i

2.1 FOR j ← I TO j

2.1.1 FOR k←1 TO K

2.1.1.1. F ← I + j + k + f

3. RETURN F What is F printed out if i=2, j=3 and k=2?

END OF ALGORITHM

(a) 70 (b) 77 (c) 84 (d) none

**11. Consider the algorithm**

1. C←1

2 .WHILE (D>0)

1. C←C\*D

(b) D←D-1

(C) RETURN C

End of algorithm

if D= 5, what will be the output of. The algorithm

(a) 5,20,60,120 (b) 5,20,60,120,120

(c) 5, 60,120,120 (d) none of these

**12. Consider the following algorithm** 1. IF B=0 THEN

(a) RETURN a else

(a) t←b

(b) b ← a MOD b

(c) a ← t

(d) GOTO 1

End of Algorithm

If a =22, b=8 what does the algorithm compute.

(a) 1 (b) 2 (c) 8 (d) 22

**13. Consider the algorithm**

1. INPUT X,Y,Z

2. IF x<y THEN

(a) IF y<x THEN maximum ←a else maximum ← b

Else

IF x<z THEN Maximum ←z

Else maximum

3. RETURN maximum

The value of a, b, c in the algorithm should be

(a) x,y,z (b) y,z,x (c) z,x,y (d) x,z,y

**15. Consider the algorithm**

1. sum ← 0

2. I ← 0

3. REPEAT

(a) sum←sum+3\*21

(b) I ← i+1

UNTIL i>7

4. RETURN sum

The value of sum returned is

(a) 381 (b) 573

(c) 765 (d) infinite

**16. Consider the program**

BIGIN

INPUT a, b

A a+10;

IF(a>b) THEN

a ← a-b;

PRINTF a

END

What will be printed if a =40 and b=20?

(a) 20 (a will be printed)

(b) 30 (a will be printed)

(c) 60 (a will be printed)

(d) 70 (a will be printed)

**18. Consider the program**

BIGIN

FOR I =1 TO -29 BY -8 DO

Print i

END

Which series result for i

(a) 1.-7.-15.-23 (b) 7,-8,-16,-24

(c) -29,-21,-13,-5 (d) none of these

**19. Consider the program.**

BEGIN

a=1;

FOR i=2 TO n DO

A=a\*1;

Print a;

END

IF n=6, then what is the output of the program?

(a) 120 (b) 720 (c) 600 (d) none

**20. Consider the program**

BINGIN

INPUT a;

Sum ← 0;

REPEAT

D ← N mod 10;

Sum ← sum +D;

N ← N DIV 10;

UNTIL N=0;

PRINT sum

END

IF a mod b and a div b given remainder and quotient respectively when a is divided by b then what is the output id N=8765

(a) 21 (b) 26 (c) 18 (d) none

**22. Consider the program**

BEGIN

Sum ← 0;

INPUT a;

FOR i= 1 TO a DO

BEGIN

INPUT b;

Sum ← sum/a;

END;

C ← sum /a;

PRINT c

END

The purpose of above program is to find.

1. Average of a numbers

(b) Average of a distinct numbers

(c) Average of b numbers

(d) None of these

**23. Consider the algorithm**

READ n

Max=0

FOR I = 1 TO n BY 2

READ x

If (x>max) then

Max ← x

RETURN max

What is the algorithm doing?

(a) Find the maximum of n numbers

(b) Find the maximum of n/2 numbers

(c) Return zero

(d) None of these

**24. How many times the loop, in the algorithm will be executed.**

1. x =4

2. While (x<>21)

3. x = x + 5

4. Return x

(a) 4 (b) 5

(c) infinite (d) none

**25. Indicate what the following program segment is donning.**

Read n

d ← 0

WHILE (none<>0)

n ← integral part of (n/10)

d = d +1

PRINT d

(a) Printing the number of digits in n

(d) Print the sum of digit in n.

(c) Infinite loop

(d) none of these

**26. How many times will “eureka” be printed in the given Algorithm**

1. FOR I=1 TO 10 BY 2

1.1 FOR j = 1 TO 20 BY 2

1.1.1. FOR K = 1 TO 30 BY 2

1.1.1.1. PRINT “EUREKA”

(a) 750 (b) 6000 (c) 749 (d) 5999

**Direction (27-45) Refer to flowcharts given at the end of this section**

**27. In flowchart 1. If x=5. Y=5 then output of the flowchart is.**

(a) 50 (b) 35 (c) 45 (d) 20

**28. In flowchart 1. If x=1, y=4 then the output.**

(a) 45 (b) 60 (c) 132 (d) none

**29. What series of numbers will be printed by flowchart 3?**

(a) 2,1,3,5,6 (b) 2,1,3,36

(c) 1,2,3,5,4 (d) 2,1,3,4,5

**30. In flowchart 2, what is the Bonus if A= 5,b=10?**

(a) 150 (b) 200 (c) 300 (d) None

**31. What will be printed by the flowchart 4?**

(a) 20,5,24 (b) 19,25,4

(c) 20,25,24 (d) 20,5,4

**32. What will be the output if A= 40 and B =20 in flowchart 5?**

(a) 20 (A will be printed)

(b) 30 (A will be printed)

(c) 30 (B will be printed)

(d) 20 (B will be printed)

(A will be printed)

**33. How many names will the flowchart 6 prints?**

(a) 10 (b) 9 (c) 11 (d) none

**34. What is the Error in the flowchart 7?**

(a) Infinite loop

(b) No initial condition specified

(c) The decision box has three exit points

(d) None of these

**35. How many even numbers will be printed by flowchart 8**

(a) Infinite (b) 5 (c) 4 (d) none.

**36. Which of the following series of numbers will the printed by flowchart 9?**

(a) 2, 4,6,8,10,8,14,16

(b) 2,4,6,8,10,12,14,12,10,8,6,4,2

(c) 2,4,6,8,7,9,11,13,9,7,5,3,1

(d) 2,4,68,10,12,14,012,2,12

**37. CRT is a variable to count the lines printed on a page. What value of CTR should be in decision box to print 20 lines per page in flowchart 10?**

(a) 20 (b) 19 (c) 21 (d) none

**38. Which flowchart segment sequence in Figure 11 is valid to print page heading and column heading on each page of a report. Page heading and column heading are of single line each?**

(a) a (b) b (c) c (d) d

**39. Refer to flow chart 12**

**List 1 List 2**

(1) A=7 (i) GOOD

(2) A=3 (ii) REJECT

(3) A=11 (iii) OK

(4) A=0

The correct match is

(1) (2) (3) (1) (2) (3)

(a) (i) (ii) (iii) (b) (iii) (ii) (I) (i)

(c) (iii) (ii) (i) (ii) (d) (i) (ii) (ii) (ii)

**40. The value of 8 at the final stage in flowchart 13 is**

(a) 108 (b) 125 (c) 117 (d)207

**41. Flowchart 14 does one of the following function Mark the correct choice**

(a) Print a list numbers

(b) Arrange a list of n data in ascending order and print if.

(c) Sum up a list of n data in descending order and print it

**42. The flowchart 15 gives the sum of first 100 odd numbers. Detect the error if any.**

(a) A should be set to 0 initially

(b) A should be checked whether equal to 199 in the decision box

(c) A should be incremented by 2 before the addition to B

(d) The loop is infinite.

**43. What is the error in the flowchart 16?**

(a) You can’t make C equal to B unless it is initialized.

(b) Only a decision box can have more then one exit.

(c) C=0 is missing

(d) Done of these

**44. Area of shaded region in the figure below is calculated by the flowchart 17. What will fill the blank steps in the flowchart?**

F R P

(a) a = √R2 , Area=C-a2

(b) a =R+I2I, Area=C-a2

(c) a = √2R2, Area=C2-a2

(d) a = √2R2, Area=C2-a2/2

**45. Based on the flowchart 18, state how many lines would be printed on each page. We have page heading and column heading of single line each.**

(a) 21 (b) 22 (c) 20 (d) 23

**46. How many times the loop will be execute in the flowchart 19? (Assume n>2)**

(a) N (b) N+1 (c) N-1 (d) N-2.

**47. The final value of A in the flow chart in previous question is?**

(a) N (b) N+1 (c) N-1 (d) N-2.

**48. The loop in flowchart 20 executed how many times?**

(a) N (b) N-1 (c) 2N (d) N-1.

GLOSSARY ON COMPUTERS 9

**Abacus:** Earliest device that qualifies as a digital computer. Simple addition and subtraction can be carried out rapidly and efficiently by positioning the beads appropriately on rack.

**Access arm:** The part of the disk storage unit that is used to hold one or more reading or writing heads

**Access provider:** Company that sells Internet connections. Known commonly as Internet Access Provider (IAP) or Internet Service Provider (ISP).

**Access Time:** The time interval between the instant at which data is called from a storage device and the instance delivery begins.

**Ada:** A high level program language named after Ada Augusta. It is a general purpose programming language developed at the request to the U.S. department of Defense for use in Military applications.

**Adder:** A device used to add two numbers (also consider Half Adder and Full Adder)..

**Address:** Locations of information of data in computers memory.

**AGP (Accelerated Graphics Port):** It is actually a Bus special designed for video cards.

**AI (Artificial Intelligence):** A branch of computer science that deal with making computer perform functions involving intelligence, reasoning & thinking capabilities that resemble those of humans.

**ALGOL (Algorithmic Language):** An algebraic high level language similar to FORTRAN that is widely used in Europe.

**Algorithm:** A sequence of precise and unambiguous instruction for solving a problem in a finite numbers of operations.

**Alphanumeric:** Pertaining to a character set that contains letters, digits, and usually other special characters such as coma, dollar sigh, plus sing etc.

**ALU (Arithmetic Logic Unit):** One of the compo9nents of central processing unit (CPU) where all mathematical and logical operations are current.

**Analog computer:** A compute that operates on data which is in the form of continuously variable physical quantities such as eclectic current.

**APL (A Programming Language):** used for statistics and mathematical fields. Requires special keyboard symbols.

**Apple’s Macintosh Operating System:** It was first Operations System which uses graphic user interface (GUI). It was widely used on Apple’s computer built around Motorola **680X0** series of microprocessors.

**Applet:** A small program written in Java, which is intended for delivery over a network to be interpreted on the fly at a Java-enabled client.

**Application Software:** software designed to accomplish specific task of user.

**Architecture:** The organization and inter connection f various components of a computer system.

**Archive:** To archive is to store information for future use. The information can be brought back, or retrieved, if necessary file is removed from a computer form a computer’s memory after being stored on devices such as a floppy disk or a compact disk.

**ARPA (Advanced Research Project Agency Network):** developed in early 1970’s. The ‘Grandfather of today’s internet’.

**ASCII (American Standard Code for Information Interchange):** A standard coding system for computers ASCII-7 is a 7-bit code and its extended version ASCI-8 is an 8-bit code.

**Assembler:** A computer program which translates an assembly language program to its machine language equivalent.

**Assembly language:** A low-level programming language in which mnemonics are used to code operation and alphanumeric symbols are used for address.

**Auxiliary Storage:** Auxiliary storage, or secondary, is the device used to keep programs and data in the computer’s memory. Usually these devices are hard disks floppy disks, or magnetic tapes. When the user wants a particular program of file, the computer takes it from auxiliary storage and puts it into the main memory. The computer can then use it quickly. Another word for storage is memory.

**Back Slash:** A back slash is the character on a keyboard. It is use when typing certain commands.

**Backspace:** To backspace is to move the cursor in a backward direction. There are two backspace keys on a keyboard. One is in a group of four arrow keys. It moves the cursor without changing anything. The other backspace key will delete any character the cursor backspaces over.

**Bandwidth:** The range of frequencies available for data transmission. The wider the bandwidth of communications system the more data can transmit in a given pried of time.

**Base:** The total number of digits (symbol) available to represent numbers in a positional number system.

**BASIC (Beginners All Purpose Symbolic Instruction Code):** developed as a time sharing language in 1964 by John Keenly and Thomas Kurtz. It had been widely used in micro-computer programming in the past.

**Batch Processing:** Running of several computer programs on after another without the need of a human operator to run each program individual.

**Baud:** A unit for measuring data transmission speed. In general usage, baud is identical to bits per second

**BCD (Binary Coded Decimal):** One of the early coding systems used by computers. Based on the idea of converting each digit of a decimal number into its binary equivalent rather than converting the entire decimal value into a pure binary from. For example, the decimal number 42 in represented by 01000010 in BCD notation.

**Binary Number System:** A number system with a base of two, consisting of two digits-0 and 1.

**BIOS:** Basic input Output System.

**Bit (binary digit):** smallest unit of storage in computer, either ‘0’ or ‘1’

**Bit per second (BPS):** Bits per second is a unit of measurement. It measures how many bits are sent transmitted in one second and shows fast a modem or other communications device runs. But rate it the sum as baud rate.

**Block transfer:** The process of transmitting one or more blocks of data where the data is organized in blocks.

**Block:** A block of information is a fixed unit of storage or memory. Usually the computer stores block size 512 bytes.

**Boolean algebra:** that deals with logical propositions which are either true or false and to simply such proposition. This algebra is suitable for use with binary number system and in designing logic circus used by the processors of computer systems.

**Boolean function:** A mathematical function in Boolean algebra. For example, x = y, x + y.

**Boolean variable:** A variable used in Boolean algebra. It can assume a value true or false.

**Boot:** To boot means to start a computer. When the computer is switched on a program automatically rur the program loads the operating system so that the computer is ready to be used.

**Booting:** The process of loading the operating system in RAM when the power turned on in a computer known as booting. This normally starts with a small program called bootstrap loader, which is stored in ROM.

**Bounced Mail:** e-mail returned to sender.

**Brach statement:** An instruction that transfers program control to one or more paths.

**Browse:** To browse means to look through a lot a information quickly. Every word is not read, at information is not necessarily looked at in an order.

**Buffer:** A small storage area that is used to store information on a temporary basis for compensating the difference in rate of data flow between various computer devices. For example, when data flows form and I/device to the CPU, it passes through a buffer.

**Built-in clock**: A built-in clock is a clock inside the computer, it keeps the time and the data in memory, and program can use the built-in-clock to put the time and data into a file or display it on the screen.

**BUS**: set of electrical conducting lines, through which binary information is transferred between CPU, storage, and peripherals.

**Byte**: Group of eight bits.

**C**: A very popular procedural programming language, invented in 1972 by Denis Ritchie AT & Be Laboratories.

**C++**: A popular Object Oriented Programming language invented in early 1980s by Bjarne Strountrup at A & T Bell Laboratories.

**Cache memory**: A small speed memory which is used to increase the speed of processing by making current programs and data available to the CPU at rapid rate.

**CAD (Computer Aided Design):** Use of computers to automatic design operations.

**Call statement:** A program statement which transfers program control to a subroutine.

**CAM (Computer Aided Manufacturing):** Use of computers to automate manufacturing operations.

**Canonical form:** A Boolean function whose term contain all variables (or their compliment). This is the unreduced form of a Boolean function in minter or maxterm form.

**Card reader:** An input device that converts data coded into punched cards into a binary format for entry into main storage. It transfers data contained on computer cards to the computer system.

**Card:** A card is circuit board that into the computer. The card lets the user add new features to the computer. These might include color, video of a modern.

**Carrier:** Any device that is used to transmit data form on location to another.

**CD-ROM:** Compact disk Read Only Memory. The user can only read a CD-ROM, not add to it.

**Central Processing Unit (CPU):** The central processing is the main part of a computer. It carries out all of the instructions from a program. It contains the arithmetic logic unit, the control unit, the registers, and often some memory and is also computer’s brain.

**Common Gateway Interface (CGI):** A programming standard that allows visitors to fill out fields on a Web page and have that information interact with a database, possibly coning back to the user as another Web page CGI may also refer to computer- Generated Imaging, the process in which sophisticated computer program create still and animated graphics such as special effects for movies.

**Chain printer:** A printer in which the character are embossed on a chain or a band. The chain is in the form of loop which rotates at a high speed and printing head are activated to print specified characters.

**Channel:** A path for carrying signal between a source and a destination.

**Character printer:** A printer with a print mechanism that prints one character at a time

**Character:** A character is any digit letter punctuation mark or symbol. A character is usually stored in one byte in a computer.

**Charge-Coupled device (CCD):** A completely electronic storage device fabricated on semiconductor chips. It stores data in the form of charge in a semiconductor.

**Chart:** Typing text into a massage box on a screen to engage in dialog with one or more people via the Internet or other network.

**Chip:** A thin wafer of silicon on which integrated electronic components are deposited.

**Circuit Switching:** Method used to interconnect tow computers where communication channel I dedicated to them for entire duration of information-interchange.

**Click:** To click means to press and release a button on the mouse. A joystick also has a button on the top, which can be clicked.

**Client:** A program that access information across an network such as a web browser or newsreader.

**CMOS:** complementary Metal Oxide semiconductors.

**COBOL (Common Business Oriented Language):** A high level programming language developed for business data processing applications.

**Code:** A set of rule outlining the way in which data may be represented within a computer system.

**Coding:** The process of writing computes instruction in programming language.

**COM (Computer Output Microfilm):** An output device that records computer output on microfilm.

**Command:** A command is an instruction to a computer or other device. A user type in each command separately or use in each command separately from an existing list.

**Communication Channel:** A medium through which data (in the form of electrical signals) is transferred from one location to another.

**Communication Protocol:** A set of rules and procedures established to interconnect and communicate between computers.

**Compact Disk:** A compact disk is a plastic disk used to store information. Compact disk are optical disks that use light to read data.

**Compatible:** Compatible describes hardware or software that can see the difference computers.

**Compile:** To convert or translate a program written in a sl;;;;;; language to an absolute or machine language form. Usually a single source statement fields more the one machine instruction.

**Complement:** For number which has a digit in it,;;;;;;; is defined as the difference between the number and the base raised to the nth power minus on l;;;;111 complement 3710  =102 -1-37=6210 In Boolean algebra, the complement of a variable is the reverse (NOT)its value. For example, complement of A is A.

**Complier:** A system software package that convert a high level language-program to machine language.

**Computer graphics:** The area of computer science which is concerned with the generation, manipulation, and display of pictures with the aid of a computer.

**Computer system:** The various computers (input and output devices store, CPU) of a computer integrated together.

**Computer:** Electronic equipment signed to automatically accept and store input data, process them, and produce output results under the direction of a details step-by-step stored program of instruction.

**Connector symbol:** Use in a flowchart to represent a junction in a flow line, this symbol is often to transfer flow between pages of a lengthy chart.

**Constant:** A value, written into a program instruction that does not change during the execution of the program.

**Control Bus:** set of wires use for the flow of control signals.

**Control Program:** An operating system program which controls the operation and management of resources of computer system. The control program major functions are job-scheduling input/output scheduling and program monitoring.

**Control Unit:** The control unit is the part of the central processing unit that sends instructions in the correct order. Fetches instruction form the computer’s memory and gets them ready for the processor. After processing the control nit puts the result back into the memory. The control unit also keeps tracks of date copied onto a disk.

**Cookie:** A text sent by a Web serve that is stored on the hard drive of a compute and relays back to the Web server things about the user, his or her computer, and/ or his or her computer activities.

**Copy:** The copy is to transfer information to other location.

**Corrupted data:** Corrupted data is data that has error in it.

**CP/M (Control Program/ Microprocessor):** A widely uses disk operating system. It is a product of Digital Research Corporation and has become a standard for many 8-bit personal computers. Similar CP/M-86 has become industry standard for many 16-bit personal computers.

**Cracker:** A person who “breaks in” to a computer through a network, without authorization and with mischievous or destructive intent (a crime in some states).

**Crash:** A crash is when computer stops working because of a fault in hardware or software. A head crash means a problem with the read-write heads.

**CRT (Cathode Ray Tube):** An electronic tube with a TV like screen upon which information may be displayed.

**Cyberspace:** Slang for the internet.

**Cycle Stealing:** The method used to transfer //////////// form the unit to memory by suppressing the data transfer between memory and CPU for one memory cycle.

**Cycle Time:** The time interval between instant at which a read/write command is given to a memory and the instant when the next such instruction can be issued to the memory (also known as memory cycle time).

**Cylinder:** Ina disk pact set a t corresponding tracks in the entire surface is called a cylinder.

**Data bank:** A data is a collection of database. It is stored in a computer, and is often available to users on-line; information can be received form a data bank by many people at the same time.

**Data Entry:** The conversion of human readable data into a form a computer system can interpret.

**Data Processing:** A series of operations that convert raw information (data) into useful information.

**Data Transfer Rate:** The special at which data is transferred from main memory to another medium on which data are recorded.

**Data:** A fine or set of files containing data stored in an organized format.

**Database:** A file or set of files containing data stored in an organized format.

**DBMS (Data Base management System):** A number system with a base of 10. The ten allowable digits are 0, 1, 2,34,5,67,8, and 9. It is used in our day-to-day life.

**Decision symbol:** A diamond-shaped symbol used in flowchart to indicate a choice or branch in the processing path.

**Default:** The pre-defined configuration of a system or an application. In most programs, the defaults can be changed to reflect personal preferences.

**De Morgan’s theorem:** A theorem in Boolean algebra which state how to complement a Boolean expression.

**Demand Paging:** The basic principle involved in demand Paging is that a page of a process is loaded into memory only it is require i.e. on demand Concept of virtual memory is used to accomplish demand paging.

**Desktop:** The main directory of the user interface. Desktops usually contain icons that represent links to the hard drive. A network (if there is one), and a trash or recycling can for files to be deleted. It can also display icons of frequently used applications, as requested by the user.

**Digital Computer:** A computer that works with discrete quantities such as voltage. Low voltage (Binary 0), High voltage (Binary 1).

**Digitizer:** An input device that is used to convert graphic and pictorial data into binary for a digital computer.

**Directory:** The term use describes a location on a hard drive where files are stored. Also called “Folder”.

**Disk pace:** The group of multiple magnetic disk mounted vertical on signal shaft.

**Disk Drive:** The equipment that operates a hard of floppy disk.

**Disk:** A flat, circular plate coated with a magnetic material on which data can be stored by magnetization of portions of the flat surface.

**Diskette:** A low cost, thin, flexible magnetic disk store device. Also can be floppy disk.

**DMA (Direct Memory Access):** The method in which data transfer between I/O device and memory takes place without the intervention of CPUT.

**DNS (Domain Name System):** The system that locates he numerical IP address corresponding to a host name

**Documentation:** The instruction manual for a piece of hardware or software.

**Domain Name:** An easy to remember name that can be used to address a pacific computer over the internet. It is associated with a specific address.

**Domain**: A part of the DNS name that specifies certain details about the host such as its location and whether it’s part of a commercial (com), government (gov), or educational (.edu) entity.

**DOS (Disk Operating System):** A very popular operating system by Microsoft which was loaded into computer every time he computer is turned on. Now days windows operating system is used because of its graphical environment.

**Dot Matrix Printer:** A dot matrix printer is a kind of printer that uses dots to from a character on the paper. Tiny pins press ribbon onto the paper. The pattern or matrix of the pins producer the character on the page. Some dot matrix print simple graphics also.

**Download:** Transfer a file from another computer to user’s computer, Upload is the reverse process.

**Drop-Down Menu:** A menu window that opens vertically on-screen to display context-related options. Also called pop-up menu or pull-down menu.

**Drum Printer:** A line printer that uses a solid rotating, cylindrical drum on which the character to be printer are embossed.

**Dumb Terminal:** A terminal that has on local processing capability.

**Digital Subscriber Line (DSL):** A method of connecting to the Internet via a phone line. A DSL connection uses copper telephone lines but is able to read data at much higher speeds than moderns and does not interface with telephone use.

**DVD:** (Digital Versatile Disk) is a new kind of disk which looks similar to the CD-ROM introduced by Philips and Sony in 1995 and is capable of string up to 4.7 Gigabytes of data.

**EBCDIC (Extended Binary Coded Decimal Interchange code):** An 8-bit coding system used primarily in IBM computer.

**E-book:** A electronic (usually hand-held) reading device that allows a person to view digitally stored reading materials.

**Edit:** To Modify format of the data by inserting of deleting characters where needed.

**Editor:** Software used to interactively review and modify text materials and other program instructions.

**EDVAC (Electronic Discrete variable Automatic compute):** An electronic computing device similar to the ENIAC although smaller, faster, and having counter capabilities. Is built in 1952.

**Electronic main (E-mail):** Electronic mails are a way of sending messages between people using a computer on a network. The massage or document can be stored at on a computer and screen and printed out.

**Electrostatic Printer:** A high-speed printer that uses charged pins to form character matrices on chemically treated paper.

**Electro thermal Printer:** A electro thermal printer that uses heated element to create character as matrices of small dots on heat-sensitive printer.

**e-mail Address:** A under private internet address to which your email is send. Takes the form user host (example, [Samarth@gmail.com](mailto:Samarth@gmail.com)).

**Emoticon:** A text based expression of emotion created from ASCII character that mimics a facial expression when viewed with your head lilted to the left, here are some examples:

**:-) Smiling**

**:-( Frowning**

**:-) Winking**

**:-( Crying**

**Encryption:** A method of securing privacy on network through the use of complex algorithmic codes.

**ENIAC (Electronic Numerical Integrator and Calculator):** The first all-electronic digital computer developed by **Mauchly and Eckert around 1946.**

**Enter:** To enter is to put information into a computer, usually through the keyboard.

**EPROM (Erasable Programmable Read Only Memory):** A semiconductor memory in which it is possible to erase information stored in it, by exposing ii to ultraviolet light. Later new information can be stored in it.

**Ethernet:** a network standard first developed by Xerox, defined by DEC and Intel, and codified as the IEEE802.3 standard. It interconnects up to 1024 personal computer in a Bus topology on each network. In its original form, it support a 10mbps data rate.

**Ethernet Card:** A board inside a computer to which a network cable can be attached.

**Execution Time:** The total time required o execute a program on a particular system is called its execution time for that computer system.

**FDDI:** Fiber Distributed data Interface.

**Fifth Generation Computer:** This computer will be introduced shortly. They will use a large number of processors working concurrently and independently. Simple programming language and knowledge based system implementation are expected in this generation.

**File:** A file is a unit of information. A computer file may hold document such as a letter, group of database records or program.

**File-Flop:** An electronic circuit which can store one bit of data.

**Firewall:** A network security system (hardware or software) that resembles to a private network from an unsecured network.

**Fire wire:** Applek Computer’s high-speed data transfer. Frequently used to improve video to a computer.

**First Generation Computer:** built between 1946 and 1954 which use vacuum tubes and were programmed in assemble language. Few examples are ENIAC, EDVAC, and EDSAC.

**Fist-In-First-Out (FIFO):** A technique for processing jobs on a first-come first-served basis.

**Fixed-Point:** A format for storing or processing number as digital integers.

**Floating-Point Number:** Signed number hold in a tractions exponent format. For example, 3216 would be represented as 0.3216\*104 in floating point notation.

**Floppy Disk:** A floppy disk is a circular place of thin, flexible plastic inside a protective case. The disk is coated with a film containing iron particles//. These particles are magnetized when data is written to the disk. Particular pointing, or aligned on way record a zero. Those aligned the other way record a one. Single sided disk hold data on one side. Double disk hold data on both sides.

**Flow line:** In a flowchart, flow line with arrowheads are used to indicate the flow of operation, the exact sequence in which instruction are to be executed.

**Folder:** A structure for containing electronic files. In some operating system, it is called a “directory”.

**Fonts:** Sets of typefaces (or characters) that come in different styles and sizes.

**Format:** To format is to prepare a disk so that it can store information. Formatting a disk puts a tracks and sectors on it which will hold data. A special utility program is run to format disk.

**FORTRAN (FORmula TRANslation):** high level, mathematical oriented programming language used for scientific and engineering applications.

**Fourth Generation Computer:** Computer built between 1975 and now. They use large-scale integrated circuits. Semiconductor memories and powerful high-level languages and operating system.

**Frame Relay:** A method of transmitting massage between computers in a WAN where a massage is broken up to variable size packets and send via the least congested route.

**Freeware:** Software created by people who are willing to give it away for the satisfaction of sharing or knowing they helped to simplify other people’s lives. It may be freestanding software. Or it may add functionality to existing software.

**FTP (File Transfer Protocol):** An Internet protocol that allows a user on one host to transfer file to/ from another host over a network. The standard method of transferring files over the Internet. An upper level TCP/IP service protocol.

**Full Adder:** Electronic circuit capable of adding three bits.

**Full Duplex:** A method of using a communication channel in which signal can be transmitted between a source and a destination in both direction simultaneously such as the output channel state is completely determined by the input channels, except during switching transient.

**General Software purpose Programming Language:** A programming language intended to solve a number of different types of problems.

**General Software Package:** A software package e.g. word-processing. Developed for a general market for many users.

**Generation:** In compute talk it is a step in technology. It provides a framework for the growth of the computer industry.

**Gigabyte (GByte):** A unit of measurement of computer memory. A gigabyte is made up of one thousand million bytes.

**GIGO (Garbage in Garage Out):** Pertains to the fact that most compute errors are not machine errors, they are data error, caused by incorrect input data. Thus, incorrect input data results in inaccurate output.

**Glitch:** The cause of an expected malfunction.

**Gopher:** An Internet search tool that allows users to access textual information a serious of menus, of if using FTP, through downloads.

**Graphic Display Terminal:** A visual display terminal which has a screen to display a graph or drawing as well as alphanumeric information.

**Groupware:** Software that allows networked individuals to form groups and collaborate on documents programs, or databases.

**GUI (Graphic User Interface):** A method of driving software through the use of windows, icons, menus, button and other graphic devices.

**Hacker:** someone who access to computer program or system without permission.

**Half Adder:** A combinational logic circuit used to add two binary digits.

**Half Duplex:** A method of using channel in which signals can be transmitted between as source and destination in both directions, but only in one direction at a time.

**Hard Copy:** Printed output for a computer in human readable form.

**Hard Disk:** A hard disk is a solid, round disk or number of these disks. The disks are made of a magnetic material and are sealed inside a case.

**Hardware:** The physical components of a computer system such as keyboard, screen, mouse.

**Hexadecimal number System:** A number system using a base of 16(0 10 A-F) shortcut notations for groups of binary digits.

**Hierarchical Network:** A communication network in which computer are connected in a tree-structure.

**Hierarchical Structure:** A tree-like structure used to represent files and records in a data base system.

**High-level Language:** A programming language whose structure is application oriented and is independent of the structure of the computer. Each statement of such a language is translated into many machine languages statements.

**Home page:** The beginning document (page) in a web site.

**HTML (hyper Text Transfer Language):** The language with which world Web documents are formatted. It defines fonts, graphics, hypertext, links and other details.

**HTTP (Hyper Text Transfer Protocol):** The protocolthat new item documents delivery to a web browser forms a web server.

**HTTPS:** Hypertext Transfer Protocol Secure Often used in intra company internet site. Passwords are required to again access.

**Hub:** A device that provides a central point of connections. The core of a star-topology network or cabling system.

**Hybrid Computer:** A combination of born. Analog and Digital computers. Some calculations are performed in Analog portion of the computer while buttons are performed in digital portion of the computer. Such computer is mostly used for scientific computation and in industrial process.

**Hyperlinks:** A coded link in hyper linked that causes new information to be retrieved.

**Hypermedia:** Integrates audio, graphic and /or video through links embedded in the main program.

**Hypertext:** A system for organizing text through links, as opposed to menu-driver hierarchy such as Gopher. Most Web pages include hypertext links to other pages at the site, or to other sites on the World Wide Web.

**Icons:** Symbols or illustration appearing on the computer screen that indicate program files or other computer functions.

**I/O Bound Jobs:** Jobs that require more of I/O operations as compared to computational operations.

**IEEE (Institute of Electrical and Electronic Engineers):** An international society of professional engineers that issues widely used networking standards.

**Impact Printer:** Prints characters using hammers to strike against paper on which information is printed.

**Information:** The result of data processing which can be used to help people make decision.

**Ink Jet Printer:** A printer device use to bring information into a computer for example card reader, keyboard, and mouse.

**Input:** Input is the information or data, centered into a computer, various types of input device are used to-enter the information.

**Instruction:** A command or order given to a computer. It normally consists of a code to indicate the operation to be performed and address (es) in memory where the operand (s) would be found.

**Instruction Register:** A register in CPU that holds the current instruction while it is being executed.

**Integrated Circuit (IC):** An integrated circuit is a tiny electronic device that consists of one or more silicon chips. Each chip may have thousand of components joined together to form circuit. They are called integrated circuit because all of the components and the links between them are made as a single piece. Integrated circuit is also known as silicon microchips, or just chips.

**Intelligent terminal:** A terminal having built-in-CPU for local processing.

**Interface:** The interconnection that allow a device a program or a person to interact. Hardware interfaces are the cables that connect the device to its power source and to other devices. Software interfaces allow the program to communicate with other program (such is the operating system), and user interface allow the user to communicate with program (e.g via mouse, menu commands, etc.)

**Interpreter:** A language processor that translates statements of the high-level language and immediately executes it before translating the next source language statement.

**Interrupt:** A signal sent to the CPU by an extern event such as when information form an input device is ready to be read.

**Instant Massaging (IM):** N chart application that allows two or more people to communicate over the Internet via real-time keyed-in message.

**IP (internet Protocol):** The most important protocol on which the internet is based. It defines how packets of data move form source to destinations.

**IP Address:** Every computer connected to the Internet has an IP address (written in dotted numerical notions), which corresponds to its domain name. domain name servers convert one to other.

**Java script:** A script language that can be used by non-programmers to orchestrate and run Java applications.

**Java:** An object oriented programming language developed by sun Microsystems, for writing distributed web applications.

**JCL (Job Control Language):** A special purpose computer language used to describe the reserve requirements of programs fed to the computer.

**Joystick:** A joystick is an input device that is used to move the cursor or other objects on the visual display unit. It is usually used with video games. A button on the top of the joystick sends command to the computer. Many joystick also have additional buttons for sending different commands.

**Key:** A key is a button on the keyboard. When a key is pressed a signal is sent to the compute. Either a character appears on the visual display unit, or a command is carried out. Different keys can be pressed at the same time to print special character, or to send commands.

**Keyboard:** A keyboard is an input device use to type in information. It has keys for the letters of the alphabet, numbers, symbols, and other keys which moves the cursor around the screen. Many computers also have function keys.

**Kilobyte (K or K byte):** A kilobyte is a unit of measurement of computer memory. A kilobyte is made up of one thousand bytes. Computer use binary code so a kilobyte is 210 or 1024 bytes.

**LAN (Local Area Network):** A digital communication system capable of interconnecting a large number of computers, terminals and other peripheral devices within a limited geographical area, typically fewer than 10 kms.

**Laser Printer:** A laser printers is a printer that uses a laser or other light source to print character on the page. The laser puts an electric charge in the shape of a character onto a rotating drum. The dry ink or toner only sticks to the drum where it has been charged. The toner is fixed to the paper using heat.

**Latency Time:** In case of disk storage, the time taken for the desired sector to come under the read/write head

**Library Routine:** A tested routine maintained in a library of program.

**Light Pen:** A pen shaped device that is used as an input device to computer by writing or sketching on the screen of a cathode ray tube.

**Line Printer:** A printer that appears to print on line at a time.

**Linker:** A system software which process and combine some independently compiled program to convert object code to executable code.

**Linux:** A UNIXR –LIKE, open-sources operating system developed primarily by Linus Torvalds. Linux is free and runs on many platforms, including both PCs and Macmtoshes. Linux is an open-source operating system, meaning that the source code of the operating system’s freely available to the public. Programmers may redistribute and modify the code as longs they don’t collect royalties on their work or deny access to their code. Since development is not restricted to a single corporation more programmers can debug and improve the source code faster.

**Liquid Crystal Display (LCD):** A liquid crystal display is a type of screen used to display information. An electric pulse causes of the screen to change color. Laptop computer use liquid crystal displays because they do not use very much power.

**LISP (List Processing):** A high level programming language suitable for handling operations non-numeric applications. It is used in the areas of pattern recognition, artificial intelligence and or simulation of games.

**Load:** Process of entering data into memory.

**Local storage:** Storage areas, called register, used by the CPU to interpret instruction and perform arithmetic and logical operations.

**Logical Error:** An error occurs when the actual logic of a program different form the desired logic.

**Logical Operators:** Symbol used to show a logic relationship between two items. Examples =,>,<,=.

**Login:** The process of identifying oneself to the network and gaining access to the network resources.

**Logout:** The process o leaving the network.

**Loop:** A sequence of instruction that is executed repeatedly until a terminal condition occurs.

**Low-Level Language:** Machine and Assembly language are low-level language. They are machine-dependent.

**LSI (Large Scale Integration):** The process of integration a large number of electronic circuits on a single, small chip of silicon or other material.

**Machine Language:** A low-level language that is directly understandable by the computer system. Each model of a computer has a unique machine language.

**Macro:** A script that operates a series of commands to perform a function. It is set up to automate repetitive takes.

**Macroinstruction:** An instruction in the source language that is equivalent to a specified sequence of machine instructions.

**Mac OS:** An operating system with a graphical user interface, developed by AppleR for MacintosR computer. Current System ‘XI’ (10) combines the traditional Mac interface with a storage Underlying UNIX R operating system for increased performance and stability.

**Magnetic Disk:** See disk.

**Magnetic Storage:** Storage device such as disk, drums, tapes, cores etc. that utilize the magnetic properties of materials to store data.

**Magnetic-Ink Character Recognition (MICR):** An input device that can read cards and paper documents printed with a special magnetic ink.

**MAN:** Metropolitan Area Network.

**Maxterm:** A Boolean quantity consisting of all terms (in its normal form or complement form) OR together. Any combination (2n for n variable) of terms and complements is permissible, provided all are included in the term.

**Megabytes:** One million (106) bytes.

**Memory Dump:** A print out of the contents of memory.

**Memory:** Memory is a device where data and programs are stored. Most computers have integrated circuit for their main memory. These are ROM and RAM chips Computer memory is measured in bytes. Another word for memory is storage.

**Menu:** A menu is a small list that appears on the visual display unit. It gives the user a choice of commands to carry out. Menus may be in words, or in picture or icons. There are pull down, pop up and pop down menus.

**Menu bar:** The horizontal strip the top of an application’s window. Each word on the strip has a context sensitive drop-down menu containing features and actions that are available for the application in use.

**Merging:** The combining of records from two or more ordered files into a single ordered file.

**MHz:** An abbreviation for Megahertz, or one million hertz. One MHz represents one million clock cycles per second and is the measure of a computer microprocessor’s speed. For example, a microprocessor that runs at 300 MHz executes 300 million cycles per second. Each instruction a computer receives takes a fixed number of clock to carry out, therefore the more cycles a computer can execute per second, the faster its program run. Megahertz is also unit of measure for bandwidth.

**Microcomputer:** The smallest category of computer fabricated using a microprocessor, and other integrated circuit, namely a ROM, RAM And I/O interface chips.

**Microfiche:** An output device that uses combined electronic, photo-optical and electromechanical techniques to convert digital output to records that can be stored as rolls of microfilm or frames of microfilm stored on cards called microfiche.

**Microprocessor:** A LSI chip which contains the entire CPU of computer.

**Microsecond:** One millionth of second.

**Millisecond:** One thousandth of a second.

**Minicomputer:** A relatively fast but small and inexpensive computer with somewhat limited input/out capabilities.

**Minimize:** A term used in a GUI operating system that uses windows. It refers to reducing a window to an icon, or label at the bottom of the screen, allowing another window to be viewed.

**Midterm:** A Boolean quantity consisting of all terms (in its normal form or complement form) Ended together. Any combination (2n for n variable) of terms and complements is permissible, provided all are included in the tem.

**MIPS (Million Instructions Per Second):** A measuring unit of processing speed of microprocessor. Throughput is also to measure the number of instruction executed by the computer per second.

**Modem (Modulator – demochuator):** Device use to convert digital signals to analog at the sending end and back to digital signals at the receiving end.

**Modulation:** The technique by which a digital signal is converted to its analog form for transmission over an analog facility (telephone line).

**Monitor:** A video display terminal.

**Monochrome:** Monochrome describes a visual display unit that can only one color on the screen.

**Moore’s Law:** A prediction that the number of transistors in microprocessor will double every 18 months.

**Mouse:** A mouse is a small plastic box with buttons on top and a ball underneath. Pressing the buttons on the mouse gives instruction to the computer.

**MP3:** Compact audio and video file format. The small size of the files makes them easy to download and e-mail. Format used in portable playback devices.

**MS-DOS:** An early operating system developed by Microsoft Corporation (Microsoft Disc Operating System).

**MSI (Medium Scale Integration):** A circuit with about 100 transistors fabricated on a single chip.

**Multimedia:** The incorporation of many types of media such as graphics, text, audio, video etc into one resource.

**Multiplexing:** A method in which communication channel is shared by number of message or signals.

**Multiprocessor:** A computer system consisting of two CPUs and a common control.

**Multiprogramming:** The name given to the interleaved execution to two or more different tan independent program by the same computer.

**Nanosecond:** One billionth (10-9) of a second.

**Napier’s Bones:** A calculating device developed by Jonh Napier and consisting of mechanical arrangement of strips of bones with numbers with numbers painted of them, which when brought in combination would perform direct multiplication.

**Netware:** A network operating system developed by Novell.

**Network:** A network is a group of device linked together. Information can be passed between the devices. Computer networks are divided into local area networks or LANs and wide area network or WANs.

**Nonvolatile Storage:** A storage medium that retains its contents even in the absence of power.

**Object Program:** Compiled or assembled program that results from the translation of a source program by a language processor.

**Octal Number System:** A number system with a base of 8. The octal digits range from 0 to7. It is commonly used as a shortcut notation for group of three binary digits.

**Offline:** A device or system not directly connected to the CPU.

**Off-Screen Formatting:** In this screen formatting is not show on the screen, instead some symbols are displayed. The results are visible only when the document is printed. WordStar is a text Editor which uses this type of formatting.

**On-Line:** A device or system directly connected to CPU.

**On-Screen Formatting:** What one sees on the screen he gets the same when printed? Here bold face, italics etc. are displayed on the screen. This type of formatting is called WYSIWYG (what you see is what you get). MS-Word uses this type of formatting.

**Open Source:** computer programs whose original source code was revealed to the general public so that it could be developed openly. Software licensed as open source can be freely changed or adapted to new uses, meaning that the sauce code of the operating system if freely available to the public. Programmers may redistribute and modify the code, as long as they don’t collect code on their work or deny access to their code. Since development is not restricted to a single corporation more programmers can debug and improve the sauce code faster.

**Operand:** The part of a machine level instruction which tells the central processor the location of the data to be manipulated.

**Operating Code:** A group of bites used to represent operation to be performed by the CPU.

**Operating System:** An integrated set of program that is use to mange the various resources and overall operation of the computer system e.g. MS-DOS, Windows, Linux.

**Optical Bar Code Reader:** An input device that is able to interpret combinations of marks (bar) that represent data.

**Optical Character Reader (OCR):** Input devices which character directly form an ordinary piece of paper by use of a scanning mechanism. These characters are written in special types fonts.

**Optical Disk:** an optical disk is a thin, circular disk which can store information. Laser light is used to read data from and writ data, to optical disks.

**Optical Mark Reader (OMR):** An input device that is able to interpret pencil marks on paper media.

**Output Device:** A device that takes information from a computer and prints or display is. A visual display unit and a printer are both examples of an output device.

**Output:** The finished results of processing by a system.

**Page Printed:** A high-speed printer with a mechanism that appeared to print an entire page at one time.

**Page Reader:** A high-speed optical input device that is able to scan and interpreter an entire page that is typed in a special font.

**Palmtop:** Palmtop describes a computer that will find in the palm of person’s hand.

**Parallel Prot:** A port normally used to connect printer to computer. It sends data over eight “parallel” wires, one byte at a time.

**Pascal:** A high level programming language named after bias Pascal that facilities the use of structured programming technique.

**Password:** A code by which a user gains access to a computer system. It is used for security purpose.

**PC (Personal Computer):** A desktop or mini-tower computer, designed for by on individual at a time. The term PC usually refers to an IBM compatible type of personal computer, while “Mac” is usually used when referring to PCs running to APPLE Macintosh System.

**PDA**: Personal digital Assistant. A hand-held computer that can store daily appointments phone numbers, addresses, and other important information. Most PDAs link to laptop computer to download or uploads information.

**PDF (Portable Document format):** A platform independent file format used deliver public documents online. It supports hyper link of other PDF document or to be web URLs.

**Pentium Chip:** Intel’s fifth generation of sophisticated high-speed microprocessors. Pentium means “the fifth element”.

**Peripheral:** The various input/output devices and auxiliary storage unit of a computer system.

**Pet byte:** A measure of storage capacity and is approximately a thousand terabytes.

**Pet flop:** A theoretical measure of a computer’s speed and can be expressed as a thousand- trillion floating-point operations per second.

**Pico Second:** One trillionth of second.

**Pirated Software:** A software for which the user does not has the proper license to use it.

**Pixel:** A pixel is the smallest area on a television screen o r visual display unit. The text or picture on the screen is made up of tiny dots called pixel. The color and brightness of each pixel is controlled by the computer. A group of pixel forms a bit map.

**PL/I:** (Programming Language one) A high level programming language designed for handing both scientific.

**Platform:** The operating system, such as UNIXR , MacintosR , windowR on which a computer is based.

**Plotter:** An output device that converts computer output into a graphic hardcopy form.

**Plug and Play:** Computer hardware or peripherals that come set up with necessary software so that when attached to computer, they are “recognized” by the computer and are ready to use.

**POST:** Power On self Test.

**Pop-Up Menu:** A menu window that opens vertically or horizontally on screen to display context-related options. Also called drop-down menu or pull down menu.

**Power PC:** A competitor of the Pentium chip. It is a new generation o f powerful sophisticated microprocessor produced from an Apple-IBM Motorola alliance.

**Printer:** A printer is a output device. Data is sent form the computer to the printer. The printer puts this data on paper.

**Printer:** An output device used to produce copy of compute output that is readable by humans.

**Procedure-Oriented Language:** High level programming language designed for the convenient expression of procedures used in the solution of a wide class of problems. For example: FORTHAN, COBOL,C.

**Process Bound Job:** The require more of computational operation (CPU time) as compared to I/O operations (I/O time).

**Processing Symbol:** A rectangular figure used in a flowcharts to indicate a processor operations.

**Processing:** Performing arithmetic, logical operations so as to convert input data into desired output result.

**Processor:** A unit of a computer system that interprets instructions and executes them.

**Program Counter (PC):** A register in CPU which is used to store the address of the next instruction to be executed.

**Program:** A program is a complete set of instruction. The instruction is followed by a compute to carry out a particular job. Program is written in a programming language. They are grouped or classified as either application program or system software.

**Programming Language:** A language used to express algorithms in computer understandable form.

**PROM (Programming Read only Memory):** Similar to read only memory with the exception that these chips can be reprogrammed by using external equipment.

**Puck:** An input device, like a mouse. It has magnifying glass with crosshairs on the front of it that allows the operator to position it precisely when tracing a drawing for use with CAD-CAM software.

**Pull-Down Menu:** A menu window that opens vertically on-screen to display context-relate options. Also called drop-down menu or pop-up menu.

**Push Technology:** Internet tool that delivers specific information directly to a user’s desktop, eliminating the need to surf for it. Point Cast, which delivers news in user-defined categories, is a popular example of this technology.

**Quick TimeR:** Audio-visual software that allow movie-delivery via the Internet and e-mail. Quick Time mages are viewed on a monitor.

**RAID:** Redundant Array of Inexpensive Disk. A method of spreading information across several disks set up to act as a unit. Using two different techniques.

**RAM:** It is a part of computer’s main memory. RAM holds the data and program that are being used by the computer at a given time. Most RAM is volatile, which mean the contents are lost when the computer is turned off.

**Right-Click:** Using the mouse button to open context sensitive drop down menus.

**Record:** A collection of related items of data treated as a unit.

**Response Time:** The total elapsed time between submission of command and data to a computer and getting the result of computation.

**Retrieves:** To retrieve information is to get, or read, it from a storage device.

**Robot:** A automatic machine that performs routine seemingly human tasks.

**ROM (Read only Memory):** Special memory chips containing instruction which can be read only, therefore preventing accidental destruction of the instructions.

**Scanner:** A scanner is an input device that transfers information from a piece of paper into a computer.

**Search Engine:** Software that make it possible to look for a retrieve material on the internet, particularly the Web. Some popular search engines are Alta Vista, Google, HotBot, Yahoo! Web Crawler, and Lycos.

**Secondary Storage Computer:** Computer built during the period 1955-64 which used transistor in CPU, magnetic core main memories and high-level language like FORTHEN and COBOL programming.

**Secondary Storage:** See auxiliary storage.

**Seek Time:** In a disk system, the time required for a read/write head to move to the track where the record to be read or written is stored.

**Server:** A center computer that makes services available on a network to other machines (Clients).

**Shareware:** Software created by people who willing to sell it at low cost or no cost for the gratification of sharing. It may be freestanding software, or it may add functionality to existing software.

**Silicon Chips:** Silicon chip is a popular name for integrated circuit.

**Simplex:** A way in which data can be transmitted so that the dat6a can flow only in one direction.

**Soft Copy:** Computer output which is displayed on the screen of a terminal and provides no permanent copy.

**Software:** The set of compare programs, procedure, and associated documentation related to the effective operation of a computer system.

**Sort:** The process of arranging data into a desired sequence.

**Source Program:** A program written in a high level source language such as assembly language, COBOL, BASIC etc.

**Special Character:** A graphic character that is neither a letter, a digit, not a space character, for example, the dollar sign, comma, period etc.

**Speech Recognition:** The ability to input data directly into a computer system by speaking to it.

**Spooling:** A technique that has been successfully used on a number of computer systems to reduce the speed mismatch between slow speeds I/O device and fast CP. It is the process of placing all data that comes from and input device (or goes to an output device) on a magnetic disk tape which are faster devices as compared to care reader/line printer.

**Spider:** A process search engines use to invest gate new pages on a web site and collect the information that need to be in their indices.

**Spreadsheet:** Software that allows one to calculate numbers in a format that is similar to pages in a conventional ledger.

**SQL (Structured Query Language):** A standard language for requesting information form and interacting with a Relational Data Base.

**SSI (Small Scale Integration):** An electronic circuit with about 20 transmission on a silicon chip.

**Stack:** A memory in which information which is stored last is on top and is retrieved first. Also known as LIFO (Last in First out) storage.

**Storage:** See memory.

**Store and Forward Method:** A method of message transmission in a computer network in which messages are sent to a central computer which receives them, stores them and forwards them to the specified destinations.

**Stored Program Compute:** A computer where the program to solve a problem and the necessary data are stored in its memory.

**Streaming:** Taking packets of information (sound or visual) form the internet and storing it in temporary files to allow it to play in continuous flow.

**Structured Programming;** An organized approach to programming involving the use of three basic control structures-sequence, branch and loop and the use of top down concepts to decompose main function into lower-level components for nodular coding purposes.

**Stylus and Tablet:** A input device similar to a mouse. The stylus is pen shaped. It is used to “draw” on a tablet (like drawing on paper) and the tablet transfers the information to the computer. The tablet responds to pressure the finer the pressure used to drew, the thicker the line appears.

**Subroutine:** A standardized program written in such a way that it can be used as part of another program whenever necessary. A subroutine is normally invoked through other programs by the use of CALL statements.

**Surfing:** Exploring the internet.

**Surge protector:** A controller to protect the computer and make up for variance in voltage.

**Surge Protector:** Computer systems characterized by their very large size and very high processing speeds. They are generally used for complex scientific applications.

**Swapping:** Storing programs on disk and then transferring these programs into main storage as and when they are needed. The technique is used to process large programs or several programs with limited memory.

**Syntax Errors:** Errors in computer programs that typically involve incorrect word sequence, undefined terms. Or misuse of terms. These errors are automatically detected and pointed out by language processors.

**Syntax:** The set of rules of a programming language that is analogous to rule of grammars in English language.

**System software:** A set of one or more programs designed to control the operation of a computer system, E.g. Operating system.

**Tape Density:** The amount of data that can be placed over a given length tape. Typical densities range from 500 bytes per inch to 6250 bytes per inch.

**TCP/IP (Transmission Control Protocol/Internet Protocol):** The collection of transport and applications protocols used to communicate on the internet and other network, regulating how data is transferred between computers.

**Teleconferencing:** Transmission of data between computer-system at different locations through telephone facilities.

**Teleconferencing:** An system in which persons sitting or CRT screens see and talk to each other vai a computer-communication network. It saves in traveling cons and valuable time of executive that would otherwise be lost by route.

**Telnet:** An Internet protocol that allows you to log on a remote compute and act as a dumb terminal.

**Terabytes (TB):** A thousand gigabytes.

**Teraflop:** A measure of a computer’s speed. It can be expressed as a trillion floating operations per second.

**Terminal:** A device equipped with a keyboard and an output device that is connected to a computer system in input or output of data.

**Testing:** The process of making sure that the program performs the intended task.

**Thermal Printer:** A printer device that utilizes paper that is sensitive to heat.

**Third Generation Computer:** Computer built between 1965 and 1974 that used integrated circuits in CPU, high speed magnetic core main memories, powerful high level languages and saw the advent of time sharing operating system.

**Throughput:** The total amount of useful processing carried out by a computer system within a given time period. It is a measure of the efficiency of computer systems.

**Time Sharing:** Refers to the allocation of computer resources in a time-dependent fashion to several programs simultaneously. It facilitates a large number of users to simultaneously use a computer for processing their jobs.

**T op-Down Approach:** A disciplined approach to system design or program design in which top-level functions are decomposed into a hierarchy of understandable lower-level modules for better management and easy handling.

**Touch Screen:** A touch screen is a computer screen or visual display unit which responds to the touch of a finger or other printer.

**Track:** In case of magnetic disk storage, one of many circular concentric rings used for string data.

**Trackball:** Input device that control the position of the cursor on the screen; the unit is mounted near the keyboard, and movement is controlled by moving a ball.

**Transistor:** A controlled electronic switch fabricated using a semiconductor. It is extensively used in the design of various electronic equipments.

**Trojan Horse:** It is a kind of virus.

**Truth Table:** A table which gives the output values for the various input combinations in case of a logical expression.

**Turnaround Time:** The elapsed time between the submission of a job to a computer system and getting its output.

**UNIVAC:** An acronym for Universal Automatic Computer. It was the first commercially available computer.

**UNIX:** The process operating system for 16-bit unit and micro computers that was designed by Bell Telephone Laboratories, USA.

**Upload:** The process of transferring information form a computer to a web site (or other remote location on a network).

**UPS (Uninterrupted Power Supply):** A battery operated power supply connected to a computer to keep the system running during power failure.

**URL (Uniform Resource Locator):** A standardized character string that identifies the location of an Internet document.

**USB:** Universal Serial Bus. An industry standard for connecting different compatible peripheral devices across multiple platforms. Devices include printers, digital cameras, scanners, game pads, joysticks, keyboards and mice, and storage device. USB peripheral offer the use of plug-and-play convenience by eliminating the need to turn off or restart the compute when attaching a new peripheral. Users can connect USB peripherals whenever they need them. For example, a user producing a newsletter could easily swap a digital camera for scanner-without any downtime. Small, simple, inexpensive, and easy to attach, USB supports simultaneous connation of up to 127 devices by attaching peripheral through interconnected external hubs.

**USB Hub:** A multiple-socket USB connecter that allows USB-compatible to be connected to a computer.

**USENET:** A large immoderate and unedited bulletin board on the internet that offers thousands of forums, called newsgroups. This range from newsgroups exchanging information on scientific advances to celebrity fan clubs.

**User Friendly:** User-friendly describes computer hardware or software that is simple to set up and run. Software that is user friendly is easy to learn and a good manual and on-screen help.

**User:** Any individual who supplies input data to, or uses information generated by, computer based system.

**Utility Programs:** Software tools that help programmers in developing, writing, debugging and documenting programs.

**Variable Name:** In a program, the name assigned to a data field that can assume any of a given set of values.

**VGA (Visual Graphics Array):** A video standard for IBM PC and compatible computers, standard had a resolution of 640\*480 and support 16 colors.

**Video Teleconferencing:** A remote “face-to-face chat,” when two or more people using a web cam and Internet telephone connection chart online. The web cam enables both live voice and video.

**Virtual Reality (VR):** A technology that allows on to experience and interact with images in a simulated there-dimensional environment. For example, you could design a room in house on your computer and actually feel that you are walking around in it even though it was never built. (The Holodeck in the science-fiction TV series Star Trek: Voyager would be the ultimate virtual reality). Current technology requires the user the ware a special helmet, viewing goggles, gloves, and other equipment that transmits and receives information for the computer.

**Visual (Very Information Resources under Seize):** An unwanted and self-replicating program that can cause harm to computer hardware or destroy important information.

**Visual Display Unit (VDU):** V visual display unit is an output device used to display information on screen. It may be monochrome or color. Most visual display units use a cathode ray tube.

**VLSI (Very Large Scale Integration):** An electronic circuit with about 10,000 transistors. Fabricated in a single silicon chip.

**Voice Response Unit:** An output device that uses words or massages recorded on a magnetic medium produce audio response.

**Volatile Storage:** A storage medium that loses its contents in the event of power failure or when power is switched off.

**WAB:** A sound format (pronounced “wave”) used to reproduce sounds on a computer.

**Web Browser:** A program that allows user to display and interact with the hyper text documents. Some of the popular Web Browsers are IE (Internet Explore), Netscape Navigator.

**Web Page:** A single Location on the World Wide Web.

**Web:** The Wide Web WWW. The internet’s world wide, HTML-based, Hypertext linked information system. Information can be in the form of text or a combination of text and graphics.

**Webcam:** A video camera/computer setup that takes live images and sends them to a Web browser.

**Website:** A group of related web pages on web.

**Wide Area Network (WAN):** A wide area network is a group of computer that communicates over long distances. The computer send data over the telephone systems often by way of satellites.

**Winchester Disk Deriver:** A disk memory in which non-interchangeable disks are used and read/write heads are built-in with the disk.

**Window:** A window is an area on the visual display unit that holds information. May windows can be opened, or displayed at the same time.

**Word Processor:** A computer system or program for setting, editing, revising, correcting, storing, and printing text.

**Worm:** See virus.

**WWW:** World Wide Web.

**WYSIWYG (What You See Is What You Get):** A common term used to describe the way information looks when it is finally published.

**Zip Drive:** A disk drive created by I-omega that special zip disk, which store upward of 100 megabytes.

**Zip File:** A file that has been compressed by a ZIP utility. To read the information, the file must be uncompressed into its original forms.

**Zip:** PC file compression format which creates file with the extension zip. Using PKZIP or WinZip software. Commonly used to reduce file transfer storage on disk.

**TEST YOUR SELF**

Appear in following diagnostic test to ascertain yourself of your competence in Computer Organization

**1. Given blow are four diagrams, one of which describes the relation given in the question. You have decides which of the diagram is most suitable to answer.**

(i). (ii)

(iii)

(iv)

CD, C.P.U, Keyboard.

(a) (i) (b) (ii) (c) (iii) (d) (iv)

**2. The data in magnetic tape is accessed.**

(a) Serially

(b) randomly

(c) Indexed sequentially

(d) direct access.

**3. Which of the following is true?**

(a) Unless enable, a CPU will not be able to process interrupts.

(b) Loop instruction cannot be interrupted till they complete.

(c) A processor checks for interrupts before executing a new instruction.

(d) Only level triggered interrupts are possible on microprocessors.

**4. Which of the following statements is correct?**

(a) Enum creates new type with predefined value

(b) Enum variables can be compared.

(c) Enum values are interpreted as integers

(d) All of the above.

**5. Which kind of terminal is entirely dependent for all its capabilities on the computer system to which it is connected?**

(a) Dumb terminal

(b) Excellent terminal

(c) Intelligent terminal

(d) CRT Display.

**6. The register which keeps tracks of the execution of a program and contains the memory address of the instruction currently being executed is known as.**

(a) Index registers

(b) memory address register

(c) program counter

(d) instruction register.

**7. A process to interrogate each I/O device in succession, in determine whether or not its needs service.**

(a) Paging (b) Polling

(c) Segmentation (d) Swapping

**8. Which of following is false?**

(a) Storage capacity of memory is inversely proportional to its access time

(b) Storage capacity of memory is inversely proportional to the cost per bit storage.

(c) CPU has direct access to both cache and main memory but n0ot auxiliary memory.

(d) Cache memory is cheaper then auxiliary memory.

**9. The technique for sharing the time of computer among several jobs which switches jobs so rapidly such that each job appears to have the computer to itself.**

(a) Time sharing (b) time out

(c) Time domain (d) multitasking

**10. Which of the following is true?**

(a) The NOR gate is equivalent to an OR gate followed by a converter.

(b) The NAND gate is equivalent to an AND get followed by an converter

(c) The NAND and NOR gates are universal gates

(d) All of the above

**11. The register which keeps track of the instruction currently beings executed is known as.**

(a) Index registers

(b) memory address register

(c) program counter

(d) instruction register

**12. The address lines required for a 256 K word memory are.**

(a) 8 (b) 10 (c) 18 (d) 20

**13. Referential integrity in SQL is represented by.**

(a) Forging (b) primary key

(c) Candidate key (d) super key.

**14. The disadvantage of passing parameters by value into subprograms is**

(a) Shallow binding and ad hoc binding.

(b) Additional storage for the formal parameters and the data transfer cost.

(c) Pass by value result ambiguity and additional recursive overhead.

(d) Prototype overloading and garage collection overhead

**15. Which of the following is function of midterm scheduler in a time sharing system?**

(a) Swapping

(b) controlling degree of

multiprogramming

(c) context switching

(d) process creation

**16. In which of the following cases overflow is detected by observing carry into the sign bit position in fixed point representation?**

(a) Adding two numbers of the same sign.

(b) Adding tow opposite sign numbers

(c) Adding tow unsigned numbers

(d) Subtracting unsigned numbers

**17. In LRU page replacement algorithm, the pages to be replaced are taken form**

(a) The past knowledge

(b) The future knowledge

(c) The present knowledge

(d) Depends on the page size of the process.

**18. Thrashing results in.**

(a) High computing activity

(b) High I/O activity

(c) low I/O activity

(d) none.

**19. The gray code of (01101010)2 is.**

(a) 01110111 (b) 01011111

(c) 10001000 (d) 10101000

**20. Given the following truth Table:**

(R is the result)

A B R

0 0 1

0 1 0

1 0 1

1 1 1

Above TT corresponds of following formula

(a) A→B (b) B→A

(c) A→B√B→A (d) none of these.

**21. The‘s complement of N in n bit is**

(a) 2n (b) 2n-N (c) 2N  (d) N-2.

**22. Consider the following sequence of instructions:**

a a + b b = a + b a = b + a.

This sequence

(a) Retains the values of a and b.

(b) Swap a and b

(c) Complement the values of a and b.

(d) Negates value so of a and b and then swaps them.

C LANGUAGE 10

**INTRUDUCTION TO ‘C’ LANGUAGE**

C is a general – propos, structure programming language C resembles other high-level structure programming such as Pascal and FORTRAN. C also contains additional features. However, that allows it to used at a lower level, thus bringing the gap between machine language and the more conventional high-level language. This flexibility allows C to used system programming (e.g. for writing operating system as well as for applications programming) (e.g. for

writing a program to solve a complicated system of mathematical equation, or for writing a rogram to bell customers). C compliers are commonly available of all sizes, and C interpreters are ecoming increasingly common. Another important characteristic of C is programs are highly portable, even more so than with other high level languages.

* **History of C language**

By the late fifties, there were many languages into existence. However, none of them where general purpose. They served better in a particular type of programming application more than others. Thus, while FORTRAN was more suited for engineering programming, COBLO was better for business programming. At this stage people started thinking that instead of learning so many languages for different programming purpose, why not have single computer languages that can be used for programming any type of application.

* **In 1960,** to this end, an international committee was constituted which came out with a language name ALGOL-60. This language could not become popular because it was too general and highly abstract.
* **In 1963,** a modified ALGOL-60 by reducing its generality and abstractness, a new language, CPL (Combined Programming Language) was developed at Cambridge University. CPL, too turned out to be very big and difficult to learn.
* **In 1967,** Martin Richards, at Cambridge University, stripped down some of the complexities form CPL retaining useful features and created BCPL (Basic CPL). Very soon it was realized that BCPL was too specific and much too less powerful.
* **In 1970,** Ken Thompson, At & T labs, developed a language known by the name B as another simplification to CPL. B, too, like its predecessors, turned out to be very specific and limited in application.
* **In 1972,** Ritchie, at AT & T, took the best of the two BCPL and B, and developed the language C. C was truly a general purpose language, easy to learn and very powerful.
* **In 1980,** Barnes Stroutrup. At Bell labs, took C to its next phase of evolution, by incorporating features of Object Oriented programming, reincarnating C into its new avatar C++. By and large, c remains the mother language for programming even today.
* **Advantage of C language**

There are several features which make C a very suitable language for writing system program. These are as follows:

* C is a machine independent and highly portable language.
* It is easy to learn as it has only as few as 32 keywords.
* It has comprehensive set of operation to tackle business as well as scientific application with ease.
* Users can create their own function and add them to the C library to perform a variety to takes.
* C language allows manipulation of BITS, BYTES, and ADDRESSES at hardware level.
* It has a large library of functions.
* C operates on the same data types as the computer, so the codes need very little data.

**COMPONENTS OF LANGUAGE**

As, with any language, C language also has following language elements:

**Character Set**

**Data Type**

**Constants**

**Variables**

**Keywords**

**Grammar (Syntax and semantic)**

* **Character Set:**

Character set of language is set of all the symbols used to write in that language. The character in C is grou8ped in four categories:

* Letter: A-Z or a-z
* Digits: 0-9
* Special Symbols: ~!@#$%^&\*()\_-+=|/{}:;”’<,.?.
* White spaces: blank space horizontal tab, carriage return, new line, for feed.
* **Data Types:**

The power of a programming language depends, among other things, on the range of different types of data it can handle. The way a value stored in a variable is interpreted is known as its data type in other words, data type of a variable is the of data it can store. Every computer language has its own set of data types it supports. Also, the size of the data types (number of bytes necessary to store the value) varies from language to language. Besides, it is also hardware platform dependent.

* **Primary Data Types**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Data Type** | **Meaning** | **Storage Space** | **Format** | **Range of Values** |
| Char | A character | 1 bytes | %c | ASCII character set |
| Int | An integer | 2 bytes | %d | -32768 + 32767 |
| Float | A single precision floating precision | 4 bytes | %f | -3.4\*1038 to +3.4\*1038 |
| Double | A double precision floating point number | 8 bytes | %lf | -1.7x10308 to +1.7\*10308 |
| Void | Valueless or empty | 0 byres | - | - |

In addition to these data types, C also has data type qualifiers- **short, long, signed,** and **unsigned.** Thus an integer type data may be defined in C as short int, long int. the range of values and size of these qualified data-types is implementation dependent. However, short is smaller than or equal int, which in turn, is smaller than long.

Unsigned int contains large range since it does not store negative integers.

**Composite Data Types:**

Also known as derived data types, composite data types are derived from the basic data types.

**Array:** Sequence of objects, all of which are of some types and have same name. e.g. int num [5]:

**Pointer:** Used to store the address of any memory location.

**Structure:** Collection of variable of different types, e.g : A structure of employee’s data i.g. name. ege. Salary.

**Union:** Collection of variables of different types sharing common memory space.

**Enumerated data type:** Its members are the constants that are written as identifiers though they have signed

integer values. These constants represent values that can be assigned to corresponding enumeration variables.

* **Constant**

A constant is an entity. With fixed value that does not change. It can be stored at a location it the memory of the computer and can be referenced through that memory address. These are four basic types of constants in C, viz. integer constants, floating-point constants, character constants and string constants. Composite types may also have constants.

Integer and floating-point constants represent numbers. They are often referred to collectively as numeric-type constants.

In specifying constants, following rules must be observed:

* Commas and blank spaces cannot be included within the constants
* The constants can be preceded by a minus (-) sign if desired.
* Value of constant cannot exceed specified maximum and minimum bounds. For each types of constant, these bounds will very form one C-compiler to another.

In C language, there are five types of constants.

1. Character: E.g. ‘p’.,’\*’’7’

2. Integer: 7, 15,4,87

3. Real 10.23 or 1023e-2

4. String “Hello”, “a1/54”.

5. Logical zero or non-zero value.

* **Variable:**

A variable is an entity whose value can change during program execution. A variable can be thought of as a symbolic representation of address of the memory space where values can be stored. Accessed and changed. A specific location or address in the memory is allocated for each variable and the value of that variable is stored in that location. Each variable has a name and data-type.

* **Rule for Constructing Variable Name**
* Variable name may be combination of alphabets, digits or underscores.
* Its length should not exceed 8 characters.
* First character must be an alphabet or an underscore (\_).
* D no commas or blank spaces are allowed in variable name.
* Among the special symbols only underscore can be used in a variable name. e.g. :emp\_age, item\_4,etc.
* No word, having a reserved meaning in C can be used for variable name.
* **Variable Declaration and Assignment of Values**

All the variables must be declared before their use. Declaration does not things:

* It tells the compiler what the variable name is.
* It specifies what type of data the variable will hold.

A variable declaration has the form:

Type-specifies comma-separate-list-of-variable:

Here type-specifies is one of the valid data types. List-of-variable is a comma-separated list of identifier representing the program variables:

e.g. int I,j,k; //creates integer variables I,j, and k.

char ch; // create a character type variable ch,

* **Keywords:**

Keywords are the words, which have been assigned specific meanings in the context of C language programs. To avoid problems, keywords should not be used as variable names. Below is the list of these reserved words.

auto double int struct

break else long switch

case enum register typedef

char exterm return union

const float short unsigned

continue for signed void

default goto sizeof volatile

for if static while

**C OPERATORS/ EXPRESSIONS**

An operator is a symbol that tells the computer to perform certain mathematical or logical manipulation on data stored n variables. the variables that are operated are termed as operands.

C contains the following operator groups.

* Arithmetic operators.
* Relational operators.
* Logical operators.
* Assignment operators.
* Increment and decrement operators.
* Conditional operators.
* Bitwise operators.
* Special operators.
* **Assignment operator =()**

The assignment operator assigns a value to a variable.

a=5;

This statement assign the integer value 5 to the variable a. the part at the left of the assignment operator (=) is known as the l value (left value) and the right one as the r value (right value).

The value has to be a variable where as the r value can be either a constant a result of an operation or any combination of these the most important rule when assigning in the right-to-left rule. The assignment operation always takes place form right to left, and never the other way::

a=b

This statement assign to variable a (the l value) the value contained in variable b (the r value). The value that was stored until this moment in a is not considered al all in this operations, and in fact that value is lost.

* **Arithmetic operators (+,-,\*,/,%)**

|  |  |
| --- | --- |
| + | Addition |
| - | Subtraction |
| \* | Multiplication |
| / | Division |
| % | Modulo |

Operations of addition. Subtraction, multiplication, and division literally correspond with their respective mathematical operators. Modulo (%) operators is the operation that gives the remainder of a division of two values. For examples, if we write: a=11%3; The variable a will contain the value 2, since 2 is the remainder form dividing 11 between 3.

* **Compound assignment operators (+=,-=,%=,>,>=,<,<=, &=,^=,|=)**

When we want to modify the value of a variable by performing an operation on the value currently stored in the variable we can compound assignment operators:

|  |  |
| --- | --- |
| **Expression** | **Is equivalent to** |
| Value += increase; | Value = value + increase; |
| a-=5; | A=a-5 |
| a / =b; | a = a / b; |
| price \*= units +1; | Price = price \* (units +1); |

* **Increment and decrement operator (++,--)**

Shortening even more some expressions, the increment operator (++) and the decrement operators (--) increase or reduce by one the value stored in a variable. They are equivalent to += 1 and to -=1, respectively. Thus:

C++;

C+1;

C=c+1;

Are all equivalent in it functionally: the three of them increase by on the value of c.

A characteristic of this operator is that it can be used both as a prefix and as a suffix. That means that it can be written either before the variable (++a). Although in simple expressions like a++ or ++a both have exactly the same meaning, in other expressions in which the result of the increment and decrement operation is evaluated as a value in an outer expression they may have an important difference in their meaning. In the case that the increase operator is used as a prefix (++a) the value is increased before the result of the expression is evaluated and therefore the value is considered in the outer expression. In case that it is used as a suffix (a++) the value stored in a is increased after being evaluated and therefore the value store before the increase operation is evaluated in the outer expressing. For example.

|  |  |
| --- | --- |
| **Example1** | **Example2** |
| B=3; | B=3; |
| A=B++ | A=++B |
| // A contains 4, B contains4 | // A contains 3, B contains 4 |

In Example 1, B is increased before its value is copied to A.

While in Example 2, the value of B is copied to A and the B is increased.

* **Relational and equality operators (==,!=,>,<,>=,<=)**

In order to evaluate a comparison between tow expressions we can use the relational and equality operators. The result of a relational operation is Boolean value that can only be true of false, according to its Boolean result.

|  |  |
| --- | --- |
| **==** | **Equal to** |
| != | Not equal to |
| > | Greater than |
| < | Less then |
| >= | Greater than or equal to |
| <= | Less than or equal to |

* **Logical operators ( !,&&,||)**

The operator! Is the C operator to perform the Boolean operation NOT, it has only operand, located at its right, and the only thing it does is to inverse the value of it, producing false if its operand is true if its operand is false.

Basically, it returns the opposite Boolean value of evaluating its operand. For example;

!(5=5) // evaluates to false because the expression at its right (5==5) is true.

!(6<=4) //evaluates to true because (6<=4) would be false.

!true // evaluates to false.

!true //evaluates to true.

The logical operators && and || are used when evaluating two expressions to obtain single relational result. The operator && corresponds with Boolean logical operation AND. This operation result true if both its tow operand are true, and false otherwise. The following panel shows the result of operators && evaluating the expression a && b:

* **&& Operator**

|  |  |  |
| --- | --- | --- |
| A | b | a && b |
| True | True | true |
| true | False | false |
| false | true | False |
| false | false | false |

The operator || corresponds with Boolean logical operation OR. This operation result true if either one of this tow

operand is true, thus being false only when both operand are false themselves. Here is the possible result a|| b:

* **|| Operator**

|  |  |  |
| --- | --- | --- |
| A | b | a || b |
| True | True | true |
| True | False | True |
| False | true | True |
| False | false | false |

**Conditional Operator (?)**

The conditional operator evaluates an expression returning a value if that expression is true and a different one if the expression is evaluated as false. Its format is condition? Result! : result2.

If condition is true the expression will return result, if it is not it will return resultl2.

7==5?4:3 //returns 3, since 7 is not equal to 5.

7==5+2?4:3 // returns 4,since 7 is equal to 5+2.

5>3? a:b //returns the value of a since 5 is greater than 3.

a>b? a:b /returns whichever is greater, a to b.

* **Coomma operator (,)**

The comma operator (,) is used to separate two or more expressions that are included where only one expression is expected. When the set of expression has to be evaluated for a value, only the rightmost expression is considered.

For example, the following code.

A=(b=3, b+2);

Would first assign the value 3 to b, and then assign b+2 to variable a. so, at the end, variable a would contain the

value 5 while variable b would contain value 3.

* **Bitwise operator (&,|,^,~,<<,>>)**

Bitwise operator modifies variables considering the bit patterns the values they store.

|  |  |  |
| --- | --- | --- |
| Operator | Asm equivalent | Description |
| & | AND | Bitwise AND |
| | | OR | Bitwise Inclusive OR |
| ^ | XOR | Bitwise Exclusive OR |
| ~ | NOT | Unary complement (bit inversion) |
| << | SHL | Shift Left |
| >> | SHR | Shift Right |

* **Size of operator**

This operator accepts one parameter, which can be either a type of a variable itself and returns the size in bytes a =sizef (char)

This will assign the value 1 to a: because char is non-byte long type.

The value returned by size of is a constant, so it is always determined before program execution:

* **Other operators**

Operator types Example Description/Meaning

() special f() Function Call

[] Subscript a[10] Array reference

-> Special s->a Structure and union member selection

. Dot s.a structure and union member selection.

+[unary] Arithmetic +a value of a

-[unary] Arithmetic -a Negative of a

\*[unary] Arithmetic \*a Reference to object at address a

&[unary] &a Address of a

~ Bitwise ~a One’s complement of a

>> Right shift a>>b a right-shifted by b bits

<< Left shift a<<b a left-shifted by b bits

* **Precedence of operators**

When writing complex expressions with several operands, we may have some doubts about which operand is evaluated first and which later. For example, in this expression:

a=5+7%2

we may doubt if it really means

a=5+ (7%2) //with a result of 6, or

a=(5+7)%2 //with a result of 0

The correct answer is the first of the two expressions, with a result of 6. There is an established order with the priority of each operator, and not only the arithmetic ones (those whose preference comes from mathematics) but for all operates which can appear in C. form greatest to lower priority, the priority order is as follows:

|  |  |  |  |
| --- | --- | --- | --- |
| Level | Operator | Description | Grouping |
| 1 | ()[] . -> ++ -- dynamic cast static cast reinterpret  cast const\_cost const\_cost typed | Postfix | Left-to-right |
| 2 | ++ -- ~ ! size of new delete | Unary (prefix) | Right-to-left |
| \*& | Indirection and reference (pointer) |
| + - | Unary sign operator |
| 3 | (type) | Type casting | Right-to-left |
| 4 | . \* ->\* | Pointer to member | Left-to-right |
| 5 | \* / % | Multiplicative | Left-to-right |
| 6 | + - | Additive | Left-to-right |
| 7 | <<>> | Shift | Left-to-right |
| 8 | <> <= >= | Relational | Left-to-right |
| 9 | == != | Equality | Left-to-right |
| 10 | & | Bitwise AND | Left-to-right |
| 11 | ^ | Bitwise XOR | Left-to-right |
| 12 | | | Logical OR | Left-to-right |
| 13 | && | Logical AND | Left-to-right |
| 14 | || | Logical OR | Left-to-right |
| 15 | ?: | Conditional | Right-to-left |
| 16 | = \*= /= += -= >>= <<= &= ^= != | Assignment | Right-to-left |
| 17 | , | Comma | Left-to-right |

**TYPE CASTING**

Converting an expression of a given type into another type is known as type-casting.

* **Implicit conversion:** Implicit conversions do not require any operator. They are automatically performed when a value is copied to a compatible type. For example:

Short a=2000;

Int b;

b=a;

here, the value of a has been promoted form short to int and we have not had to specify any type-casting operator.

* **Explicit conversion:**

C is a strong-typed language. May conversion, especially those that imply a different interpretation of the value, require an explicitly conversion. For eg.

Short a=200;

Int b;

b= (int)a; //C-like cast notation

b=int (a) // functional notation

Functionality of these explicit conversion operators is enough for most needs with fundamental data types.

* **Explicit type casing operator**

Type casing operators allow you to convert datum of a given type to another, there are several ways to do this in C. the simplest on, which has been inherited form the C language, is to priced the expression to be convert by the new enclosed between parentheses (()):

Int 1;

Float f=3.14;1 (int) t;The previous code converts the float number 3.14 to an integer value (3), the remainder is lost. Here, the typecasting operator was (int).

**PRACTICE EXERCISE-1**

**1. c language has been developed by**

(a) ken Thompon (b) Denis Ritchie

(c) Peter Norton (d) Martin Richard

**2. C can be used on**

(a) Only MS-DOS operating system

(b) Only Linux operating system

(c) Only Windows operating System

(d) All the above

**3.** C program are converted into machine language with the help of

(a) An editor

(b) A compile

(c) An operating system

(d) None of the above

**4. The real constant in C can be expressed in which of the following forms.**

(a) Fractional form only

(b) Exponential form only

(c) ASCII form only

(d) Both Factional and Exponential forms.

**5. A character variable can at a time store**

(a) 1 character

(b) 8 character

(c) 254 character

(d) none of the above

**6. The statement char ch=’Z’ would assign in ch**

(a) The character Z

(b) ASCII value of Z

(c) Z along with the single inverted commas

(d) Both (a) and (b)

**7. Which of the following is not a character constant?**

(a) ‘Thank You’

(b) ‘Enter values of P,N,R’

(c) ’23.56E-03’

(d) All the above.

**8. The maximum value that an integer constant can have is.**

(a) -32767 (b) 32767

(c) 1.7014e+38 (d) -1.7014e+38

**9. A C variable cannot start with**

(a) An alphabet (b) A number

(c) A special symbol other than underscore

(d)Both (b) & (c)

**10. Which of following statement is wrong**

(a) mes=123.56; (b) con=’T’\*’A’

(c) This=’T’ \*’20’; (d) 3+a=(b):

**11. Which of the following show he correct hierarchy of arithmetic operators in (C)**

(a) \*\*, \*or/,+or (b) \*\*, \*,/, +, -

(c) \*\*, /, +,- (d) / or\*, -or+

**12. In (b)=6.6/a+2\*n; which operation will be performed first?**

(a) 6.6/a (b) a+2

(c) 2\*n (d) depends upon compiler

**13. Which of the following is allowed in C Arithmetic maturations?**

(a) [] (b) {} (c) () (d) None

**14. Which of following statements is False?**

(a) Each new C instruction has to be written on a separate line

(b) Usually all C statement are entered in small case letters.

(c) Blank spaces may be inserted between two words in a C statement

(d) Blank spaces cannot be inserted within a variable name

**15. If ais an integer variable, a=5/2; will return a value.**

(a) 2.5 (d) 3 (c) 3.14 (d) 0

**16. The expression, a =7/22\*(3.14+2)\*3/5 evaluates to:**

(a) 8.28 (b) 6.28 (c) 3.14 (d) 0

**17. The expression, a=30\*1000+2768; evaluates to.**

(a) 32786 (b) -32768 (c) 11.040 (d)0

**18. The expression x=4+2%-8 evaluates to**

(a) -6 (b) 6 (c) 4 (d) None

**19. Hierarchy decides which operator**

(a) is most important

(b) is used first

(c) is fastest

(d) Operators on largest numbers

**ANSWERS:-**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | B | 2 | D | 3 | B | 4 | D | 5 | A | 6 | D | 7 | D | 8 | B |
| 9 | D | 10 | D | 11 | D | 12 | A | 13 | C | 14 | A | 15 | C | 16 | D |
| 17 | B | 18 | B | 19 | 20 | A | 21 | 22 | A | 23 | 24 | D | 25 | b |  |

INTRODUCTION TO PROGRAMMING IN C 11

**Structure of a C Program:**

The following rules are applicable to all C-statements:

* Blank space may be inserted between two words to improve the readability of the statement. However, no blank space is allowed within word.
* Most of the C-compilers are case-sensitive, and hence statements are entered in small case letters.
* C has no specific rules about the position at which different parts of a statement be written. Not only can C Statement be written anywhere in a line, it can also be spilt over multiple lines. That is why it is called free-format language.
* A C-statement ends with a semi-colon (;)

**A C program basically has the following form:**

* Preprocessor Commands
* Type definitions
* Function prototypes-declare function types and variable passed to function.
* Variables
* Functions

We must have a main () function.

A function has the form:

**Type** function name (parameters)

**{**

Local variables

C Statements

}

**HEADER FILES**

Header files contain definitions of function and variable which can be incorporated into any C program by using the pre-processor #include statement. Standard header files are providing with each compiler, and cover a range of areas. String handling. Mathematical, data conversion, printing and reading of variables. To use any of the slandered functions, the appropriate header file should be included. This is done at the beginning of the C sourcefile. For example, to use the function printf() in a program, the line

#include<stdio.h>

The header file have the extension.h and generally reside in the/include subdirectory.

#include<stdio.h>

#include “mydecles.h”

The use of angle brackets<> informs the compile to search the compilers include directory for the specified file.

The use of the double quote “” around the filename inform the compiler to search in the current directory for the specified file.

**INPUT/OUTPUT IN C**

* **The scanf command:** (BASIC INPUT command)

Takes input from the keyboard, and stored it in specified variable, syntax is:

**Scan (“%vartype”, %varname);**

For example, this line

**scanf(“%d%d”,&a,&b);**

Gets string input, and sticks it in a variable called star name.

You can scanf more than one variable at a time like this

**scanf (“%d%d”,&a,&b);**

This line will scan in two integers, and name them a, b, and c respectively.

* **Formatters for scanf()**

The following characters, after the % character, in a scanf argument have the following effect.

%d read a decimal integer.

%o read an octal value.

%x read a hexadecimal value.

%h read a short integer.

%l read a long integer.

%f read a float value.

%e read a double value.

%c read a single character

%s read a sequence of characters

%[…] read a character string 5 character inside the bracket indict.

%\* this is used to skip input held.

* **Example of scanf () modifiers**

Int numbers;

Char text 1[20], text 2[25];

scanf (“%s %d %\*f %s”, text 1, &numbers, text2);

if the user response is,

hello 14736.55 uncle sam

then

text 1 = hello, number=14, text2=uncle

and the next call to the scan function will continue from where the last one left off, so if

scanf(“%s”,text2);

was the next call, then

text=sam

* **The printf command:** (BASIC PRINT command)

The “f” printf’ for stands for “formatted”. Although it can be (and often is) used to output simple text strings. Printf can also used to insert variables (as we’ll see shortly), as well as to specify the field width (typically used to specify the number of decimal places for a number). Printf seems deceptively simple at first, but is has a few formatting options which give it some sophistication that goes beyond simple “Hello, world !” functionality. Printf syntax is:

**Printf(“text”);**

For example, this: printf (“Hello, world!”);

Prints “Hello, world!”

To print variables (which, basically, are data values that vary), the syntax is:

**Printf (“%vartype”, varname);**

Where % varitype is the type of variable and varname is the actual name of it. For example, this:

**Printf(“%s”, strname);**

Printf out the string called strname.

* **Formatter for printf**

%s string

%c character

%d character

%d int (integer)

%f float

%if double

**Example of C program**

#include<stdio.h>

Int main()

{

Printf(“Hello World\n”);

Return 0;

}

**#include<stdio.h>**

This includes a file called stdio.h which lets us use certain commands. Stdio is short for standard input/output which means it has commands for input like reading form the keyboard and output like printing things on the screen.

**Int main()**

Int is what is called return value main is the name of the point where the program starts and the brackets are there for a arguments. They indicate main is a function.

{}

The 2 curly brackets are used to group all the commands together so it is known that the commands belong to main. These curly brackets are used vary often in C to group things together.

**Printf (“Hello World\n”);**

This is the printf command and it prints text on the screen. The data that is to be printed is put inside brackets.

You will also notice that the words are inside inverted commas because they are what is called a string. Each letter is called a character that is grouped together is called a string. String must always be put between inverted commas. The \n is called as escape sequence and represents a new line character and it used because when you press ENTER it doesn’t insert a new line character but instead takes you onto the next line in the text editor. You have to put a semi-colon after every command to show that it is the end of the command.

* **Table of commonly use escape sequences:**

\a Audible single

\b Backspace

\t Tab

\n new line

\v Vertical tab

\f new page\Clear screen

\r Carriage return

**Return o;**

The int in main() is short for integer which is another word for number. We need to use the return command to return the value 0 to the operating system to tall here were no errors while the program was running. If we don’t need to return any value void can be used.

**PRACTICE EZERCISE -2**

**1. if a=0x6db7=0xa726, what is the value**

**{ main ()**

**Of a & b?**

(A) 0x6db7

(b) 0xca91 int a, b, c: b=2;

(c) 0xab92

(d) 0x2526 a=2\*(b++);

**2. if a=0x6db7 and b=0xa726, what is the }**

**Value of a^b?**

(a) 0xceb7 (b) 0xca91

(c) 0x58d9 (d) 0x2526

**3. The expression a<<6 shifts all bits of six places to the left. If**

a 0 x 6db7, what is the value of a<<6?

(a) a<<6? (b) 0xa72b

(c) 0x6dc0 (d) 0x1111

**4. Consider the following set of statements:**

Float x,y;

X=7;

Y=10;

X\* y\* =y+28.5;

After the execution of the above set of statement, the value of x will be,

(a) 1995 (b) 2695

(c) 70 (d) None

**5. Consider the following program** #include <stdio.h>

main()

{

Int age; char sex;

Put(“what is your age?”);

Scanf(“%d”,&age);

Puts(“what is your sex?”);

Sex=getchar()

}

What happens when the above program is compiled and executed?

(a) Produces syntax error

(b) Accepts age but it does not wait to input sex

(c) Accepts age sex from standard input

(d)None of these

**6. The && and operators**

(a) Combine two numeric values

(b) Compare two numeric values

(c) Compare two Boolean values

(d) Perform none of the above

**7. Consider the following program fragment:**

The correct values are

Main()

{

Int a,b,c;= b=2;

A=2\*(b++);c=2\*(++b);}

(a) b=3,c=6 (b) a=3,c=8

(c) a=4,c=6 (d) a=4,c=8

**8. if we say that the C statement.**

If (a>b) z=a else z=(b);

Can also be written as

(i) z=(a>b)? a:b or as:

(ii) (a>b)? z=a: (b);

Then which one of the following is true?

(a) Only (i) is correct

(b) Only (ii) is correct

(c) Both (i) and (ii) are correct

(d) Neither (i) and (ii) is correct

**9. Which operator will evaluate all the operands (of all data type):**

(a) && (b) (c) || (d) ?:

**10. The following lines, if included in a program will cause one of the following errors. Indicate the correct one.**

Double (c);

Scanf(“%c”,(c));

{

(a) Runtime error (b) Compilation error

(c) Type of error (d) No error

**11. The statement #include<math.h> is written at the top of a program to indicate that**

(a) the performs heavy mathematical calculations.

(b) the beginning of the program

(c) that certain sets of information about mathematical library functions are to be included at the beginning of the program

(d) None the these

**12. What will be the values assigned to a, b, c if the statements scanf (“%d %d”, &a, &b, &c) is extended with input data item 1213456?**

(a) a and b are not assigned anything (c) = 123456

(b) a=1, b=2, c=3

(c) a=123456 and nothing is assigned to b and c

(d) a=12, b=34, c=56

**13. What will be the values assigned to a, b and c if the statements scanf(“%3d, %3d ,%3d”, &a, &b, &c) is executed with input data as 123456789b9 (b denoted blank space)?**

(a) a =123, b=4, c=567

(b)a =123, b=456, c=789

(c) a=123, b=567, c=789

(d) a=1234, b=5678, c=9

**14. What will be the value of 1, x and c if scanf (“%3d %5f, %c”, &1, &x, &c) is execute with input data 10b256.875bT?**

(a) 1=010, b=256.87, C=’5’

(b) 1=100, b=256.87, c=.789

(d) 1=10, b=256.8 ,c= ‘7’

**14. A declaration “short in” is used for variable**

(a) Which have short names?

(b) Which have short duration in a program?

(c) Which may require lees storage than normal integers?

(d) All of the above

**16. In case of ordinary int variables**

(a) The leftmost bit is reserved for sign

(b) The rightmost bit is reserved for sign

(c) No bit is reserved for sign

(d) None of the above

**17. What would be the value of C?**

{

Int c;

Float a, b;

A=245.05; b=40.02

C=a + b;

}

(a) 285.0 (b) 285.02

(c) 2850 (d) 285

**18. What would be the value of I and K?**

{

Int I, j, k;

J=5;

I=2\*j/2

K=2\*(j/2);

}

(a) i=4, k=5 (b) i=4,k=4

(c) i=5, k=4 (d) i=5,k=5

**19. if a=-11 and b=-3 what is the value of a % b?:**

(a) 2 (b)-2 (c) -3 (d) 3

**20. Suppose i, j, k are integers variable with values 1,2,3 respectively. What is the value of the expression! (j + k) > (I + 5)?**

(a) 6 (b) 0 (c) 1 (d) 3

**21. Suppose 1=7, f=5.5 and 0=’w’. what is the value of the expression (c)!= ‘p’ || I + f <=10)?**

(a) 1 (b) -1 (c) 0 (d) not

**22. What is the legal rang of values for int?**

(a) -216 to+216 (b)-28 to 28

(c) -215 to 215 -1 (d) -27 to 27 -1

**23. What will the following code segment will do.**

A=10, B=20

A=A+B

B=A+B

A=A-B

(a) While assign A=30 B=20

(b) Will interchange A and B.

(c) Will not change value of A & B

(d) None of the above

**24. Which is not a keyword in C?**

(a) int (b) main (c) include (c) void

**25. c1 ||c2 means**

(a) c2 is executed if c1 fails

(b) c2 is executed if c1is successful

(c) c1 and c2 both are executed

(d) None of the above

**Ansers:-**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | D | 2 | A | 3 | C | 4 | B | 5 | C |
| 6 | C | 7 | D | 8 | A | 9 | B | 10 | A |
| 11 | C | 12 | C | 13 | A | 14 | D | 15 | C |
| 16 | A | 17 | D | 18 | C | 19 | B | 20 | C |
| 21 | A | 22 | C | 23 | B | 24 | B | 25 | a |

CONTROL STATEMENTS 12

**BRANCHING INTRODUCTION**

Generally, C language program follows sequential form of execution of statement. Many times it is required to alter the flow of the sequence of instruction. C language provides statement that can alter the flow of a sequence of instruction. These statements are called control statements. These statements help to jump from one part of the program to another. The control transfer may be conditional or unconditional.

* **If statement**

The simplest form of the control statement is the if statement. It is very frequently used in decision making and allowing the flow of program execution. The if structure has the following syntax.

Statement:

The statement is any valid C’ language and the condition is any valid C language expression, frequently logical operators are used in the condition statement. The condition part should not end with a semicolon, since the condition and statement should be put together as a single statement. The command say if the condition is true then perform the following statement of if the condition is false the computer skips the statement and moves on to the next instruction in the program.

**Example program**

Calculate the absolute value of an intger\*/

#include<stdio.h> //include th stdio.h file

Void main() // start of the program

{

Int numbers; //Declare the variables

Printf(“Type a number”); //read the number from standard input

Scanf(“%d”,& number) //read the number from standard input

If(number<0) // check whether the number is a negative number number=-number; // if it is negative then convert it into +ve

Printf (“The absolute value is %d\n”, number); // print the value using prinf

}

The above program checks the value of the input number to see if is less than zero. If it is then the following program statements which negates the value of the number is executed. If the value of the number is no less the zero. We do not want to negate it then this statements is automatically skipped. The absolute number is then displayed by the program, and program execution ends.

* **The if else construct:**

The syntax of the if else construct is as follows

If (condition)

Program statement 1;

else

program statement 2;

the if else actually just on extension of the general format of if statement. If the result of the condition is true, then program statement 1 is executed, otherwise program statement 2 will be executed. If any case either program statement 1 is executed or program statement 2 is execute but not both.

**Example program**

//program find whether a number is negative or positive\*/

#include<stdio.h>

Void main () //start of the maim

{

Int num; // declare variable nu as integer

Printf (“Enter the number”);

Scanf(“%d”,&num); //read the input number from keyboard

If (num<0 ) // check whether number is less than zero

Printf(“The number is negative”);

else

Printf (“The number is positive”);

}

In the above program the if statement checks whether the given number is less than 0. If it is less than zero than it is negative therefore the condition become true then the statements number is negative is executed. If the number is not less than zero the if else construct skips the first stamen and prints the second statement declaring that the number is positive.

* **Compound Relational tests**

C language provides the mechanism necessary to perform compound relational tests. A compound relational test is simple one or more simple relational tests joined together by either the logical AND or the logical OR operators. These operators are represented by the character pairs && || respectively. The compound operators can be used to from complex expression in C.

The compound if structure has the following syntax

(a) if (condition1 && condition2 && conditiona3)

(b) if (condition 1 || condition2 || condition3)

The syntax in the statements ‘a’ represents a complex if statement which combines different conditions using the and operator in this case if all the conditions are true only then the whole statements is considered to be true. Even if one condition is false the whole if statement is considered to be false.

The statement ‘b’ uses the logical operator 0 (||) to group different expression to be checked. In this case if any of the expression if found to be true the whole expression considered to be true, we can also uses the mixed expression using logical operator and o together.

**Example program**

\*/ Example program using compound if else construct\*/

/\*This program determines if a year is a leap year\*/

#include<stdio.h>

Void main() // start of the program

{

Int year, rem\_4, rem\_10 rem\_400; // variable declaration

Printf(“Enter the year to be tested”); // message for user

Scanf (“%d”,&year); //Read the year for standard input

Rem\_4=year%4; // fine the remainder of year-by 4

Rem\_100=year %100; // find the remainder of year by 100

Rem\_400=year %400; // find the remainder of year- by 400

If((rem\_4==0 &&rem\_100!=0) || rem\_400==0)

//apply if condition 5 check whether remainder is zero

Printf(“It is leap year, \n”,); // print true condition

else

printf (“No. It is not a leap year ”);

}

* **Nested if Statement**

The if statement may itself contain another if statement is known as nested if statement. The Nested if structure has the following syntax.

If (condition 1)

If (condition 2)

Statement -1;

else

statement -2;

else

statement -3;

the if statement may be nested as deeply as you need to nest it. On block of code will only be executed if two conditions are true. Condition 1 is tested first and then codition2 is tested. The second if condition is nested in the first. The second if condition is tested only when the first condition is true else the program flow will skip to the corresponding else statements.

**Example program**

#include<stdio.h>

Main() // start of main function

{

Int a, b, c big;

Printf (“Enter three number”); // message to the use

Scanf (“%d %d %d”, &a, &b, &c); //Read variable a, b, c

If (a>b) // check whether a is greater than b if true then

If (a>c) //check whether a is greater than c

big = a; // assign a to big

else if (b>c) // if the condition (a>b) fails check whether b is greater than c

big =b; // assign b to big

else big =c; // assign C to big

printf (“Largest of %d, %d&%d=%d”, a, b, c, big);

}

// print the given number along with the largest number

In the above program the statement if(a>c) is nested within the if(a>b). if the first if condition if(a>b) true only then the second if statement if(a>c) is executed. If the first if condition is executed to be false then the program control shifts to the statement after corresponding else statement

* **The else if ladder**

When a series of many conditions have to be checked we may use to ladder else if statement. The if else ladder structure has the following syntax.

If (condition 1)

Statement – 1;

else If (condition 2)

Statement -2;

else If (condition 3)

statement -3;

else If (condition 4)

statement -4;

else If (condition)

statement n;

else(Default statement);

statement –x;

This construct is known as if else construct of ladder. The conditions are evaluated from the top to the ladder to downwards. As soon on true condition is found, the statement associated with it is executed and the control is transferred to the statement –x (skipping the rest of the ladder. When all the condition becomes false, the final else containing the default statements will be executed.)

**Example program**

/\* Example program using if else ladder to grade the student according to the following rules.

**Mark Grade**

70 to 100 Distinction

60 to 69 Class First

50 to 59 Class Second

40 to 49 Class pass

0 to 39 Fail

#include <stdio.h>

Void main()

{

Int marks;

Printf (“Enter the marks\n”);

Scanf(“%d”, &marks);

// check whether marks is less than 100 or greater

If(marks <= 100 && marks>=70)

Printf(“\n Distinction”);

// else if the precious condition false check whether marks>60

else if (marks >=60)

printf (“\n first class”);

// if previous condition is false check for marks >50

else if (marks >=35)

printf(“\n pass class”);

else

printf(“\n fail”); // default statement

} // close of main

The above program checks a series of conditions. The program beings from the if statement and then checks the series of conditions it stops the execution of remaining if statement whenever a c condition becomes true.

In the first if condition statement it checks whether the input value is lesser than 100 and greater than 70, if both conditions are true it prints distinction. Instead if the condition fails then the program control is transferred to the next if statement through the else statement and now it checks whether the next condition given is whether the marks value is greater than 60 if the condition is true it prints first class and comes out of the if else chain to the end of the program on the other hand if this condition also fails to control is transferred to next if statements program execution continues till the end of the loop and executes the default else statement fails and stops the program.

* **The switch Statement:**

Unlike the if statement which allows a selection of two alternatives the switch statement allows a program to select one statement for execution out of a set of alternatives. During the execution of the switch statement only one of the possible statements will be executed the remaining statements will be skipped. The usage of multiple if else statement increases the complexity of the program since when the number of if else statement increase it effects the readability of the program and makes it difficult to follow the program. The switch statement removes this disadvantage by using a simple and straight forward approach.

The general format of the switch statement is

Switch (expression)

{

Case label-1:

Case label-2:

Case label -n:

………………

Case default:

}

When the switch statement is executed the control expression is evaluated first and the value is compared with the case label value in the given order. If the label matches with the value of the expression then the control is transferred directly to the group of statement which follows the label. If none of the statements matches then the statement against the default is executed. The default statement is optional in switch statements is case if any default statement is not given and if none of the condition matches then no action take place in this case the control transfers to the next statement.

**Example program**

//Example switch program

// A program to stimulate the four arithmetic operations using switch.

#include <stdio.h>

Main()

{

Int num1, num2, result;

Char operator;

Printf (“Enter two numbers”);

Scanf (“%d %d”, &num1, &num2);

Printf (“Enter an operator”);

Scanf (“%c”, &operator);

Switch (operator) // start of the switch construct

{

// if the operator is ‘+’ add the1 number & store it in result

Case ‘+’: result=num1+num2;

break;

// if the operator is ‘-‘ subtract the 2 number

Case ‘-‘: result=num1-num2;

Break;

// if the operator is ‘\*’: result=num1\*num2;

Break;

// if the operator is ‘/’ then else check for division by zero if the second number is zero c

Case ‘/’:

If (num2!=0)

Result =num1/num2

Else

{

Printf(“warning: division by zero \n”);

Result -0;

}

Break:

// if the operator entered is none of the 4 operators print message & set the result value to zero.

Default:

Printf(“\n unknown operator”);

Result=0;

Break;

}//close the switch block

Printf (“%d”, result); // print the result

}// close of main

In the above program the break statement is need after the case statement to break out of the loop and prevent the program from executing other case.

* **The goto statement:**

The goto statement is simple statement used to transfer to program control unconditionally form one statement to another statement. Although it is might not be essential to use the goto statement in a highly structured language like C, there may be occasion when the use of goto is desirable.

Goto label;

…………………

…………………

Label:

goto: label:

the goto require a label in order to identify the place where the branch is to be made. A label is a valid variable name followed by a colon. The label is placed immediately before the statement where the control is be transformed. A program may contain several goto statements that transferred to the same place when a program. The label must be unique. Control can be transferred out of or within compound statement, and control can be transferred to the beginning of a compound statement. However the control cannot be transferred into a compound statement. The goto statement is discouraged in C, because it alters the sequential flow of logic is the characteristic of C language.

**PRACTICE EXERICSE-3**

**1. main()**

{

Int a=300, b=10, c=20;

If(!a>=400)

b=300;

c=200;

printf (“b=%d c=%d”, b, c);

}

(a) b=10 c=20 (b) b=300 c=200

(c) b=10 c=200 (d) b=300 c=20

**2. Given the following code fragments.**

**(I)**

If (a==0) printf(“zero’);

If(a==1) printf (“One”;

If(a==2) printf (“two”)

Which code is batters?

(a) I (b) II

(c) Both are same (d) Cannot be evaluated

**3. Which is odd on out?**

(a) i=i+1; (b) i+=1;

(c) i++; (d) i=+1;

**4. In the following program**

Main()

{

Float =1.5;

Switch (a)

{

Case 1.0: printf(“\n Hello Friends”);

Case 1.5: printf(“\n How are you”);

Case 2.0: printf(“\n How is life”);

}

The output of this program will be;

(a) How are you

(b) How are you, How is life

(c) Syntax error

(d) none of these

**5. Main()**

{

int I;

i=30000;

if(I <\_50000) i=i+5000;

else

i=i-5000

printf(“%d”,i);

}

Now the final value of its:-

(a) 3500 (b) 25000

(c) -30536 (d) -2233

**6. What will be the output of the following C language program?**

Main

{

Int i=4;

Switch (i)

{

Default: printf (“Inside default”);

Case 1: printf (“Inside first”); break

Case 2: printf (“Inside second”); break

Case 3: printf (Inside Third);

}

}

(a) Error, default should be the last case.

(b) Error, there can be more than one statement per line.

(c) “Inside default will be printed”

(d) None of these

**7. What will be value of j after the execution of following code in C language?**

Int i=10,j=4;

I=i+(j++)

If(i>=15)

J=j++ +I;

else:

j= ++I +j;

(a) 21 (b) 16 (c) 17 (d) 20

**Direction (8-25):** What would be the output of the following programs?

**8. Main()**

{

Int a=300, b, c;

If(a>=400)

B=300;

C=200;

Printf (“\n %d %d”, b, c);

}

(a) b = 300, c=200

(b) Garbage value both b & c

(c) None of the value

(d) b = Garbage value, c=200

**9. Main()**

{

Int x=3;

Float y=3.0;

If(x==y)

Printf(“\n x and y are equal”);

else

printf (“\n x and y are not equal”);

}

(a) Syntax Error

(b) x and y are equal

(c) x and y are not equal

(d) Run time error

**10. Main()**

{

Int x=3, y, z;

Y=x=10;

Z=x<10;

Printf (“\n x=%d y=%d z=%d”, x, y, z);

}

(a) x = 3, y=10, z=1

(b) x=3, y=3, z=1

(d) x=10, y=10, z=0

(d) x=10, y=10 z=1

**11. Main()**

{

Int k=35;

Printf(“\n %d %d”, k==35, k=50,k>40);

}

(a) 0,50,0 (b) 1, 50, 1

(c) syntax error (d) 35,50,40

**12. Main()**

{

Int x=15;

Printf (“\n %d %d”, x!=15,x=20,x<30);

}

A

(a) 10 20 30 (b) 1 20 1

(c) 0 1 0 (d) 0 10 1

**12. main()**

{

Int i=4,j=-1,k=0,y,z;

Y=i+5&&j+1 ||k+2

Z=i+5||j+1&&k+2;

Printf(“w=%dx=%d y=%d z%d”,w,x,y,z);

}

(a) w=1 x=1 y=1 z=1

(b) w=1 x=0 y=1 z=1

(c) W=0 x=0 y=0 z=0

(d) w=0 x=1 y=0 z=0

**14. main()**

{

Int i=4,u=-1,k=0,y,z;

Y=i+5&&j+1||k+2 z=i+5||j+1&&k=2;

Printf(“\n y=%d z=%d”, y,z);

}

(a) y=0,z=1 (b) y=0,z=0

(c) y=1,z=0 (d) y=1,z=1

**15. main()(**

{

Int (i=-3,j=3);

If (!i+!j\*1)

Printf(“\n Massaro”);

Else

Printf(“\n Bennarivo”);

}

(a) Massaro (b) No Result

(c) Bennarvo (d) Error

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 1 | B | 2 | B | 3 | D |
| 4 | C | 5 | C | 6 | C |
| 7 | D | 8 | D | 9 | B |
| 10 | C | 11 | A | 12 | B |
| 13 | B | 14 | D | 15 | C |

LOOPS 13

**C PROGRAMMING-LOOPING**

During looping a set of statements are executed until some conditions for termination of the loop is encountered. A program loop therefore consists of two segments one known as body of the loop and other is the control statement. The control statement testes certain and then directs the repeated exaction of the statement contained in the body of the loop.

In looping process in general would include the following four steps

1. Setting an initialization of a counter

2. Exertion of the statements in the loop

3. Test for a specified condition for the execution of the loop

4. Incrementing the counter

The test may be either to determine whether the loop has repeated the specified number of times of to determine whether the particular condition has been met.

* **For loop**

The for loop provides a more concise loop control structure.

The general for of the for loop is

For (initialization; test condition; increment)

{

Body of the loop

}

When the control enters for loop the variables used in for loop is initialized with the stating value such as i=0. The value which has initialized is then checked with the given test condition. The test condition is a relational expression, such as i<5 that checks whether the given condition is satisfied or not if the given condition is satisfied the control enters the body of the loop or else it will exit the loop. The body of the loop is entered only if the test condition is satisfied and after the completion of the variable is incremented using a s assignment statement such as i=i+1 or simply i++ and the new value of control variable satisfied then the body of the loop is again executed. The process goes on till the control variable fails to satisfy the condition.

**Addition features of the for loop**

We can include multiple expressions in any of the fields of for loop provided that we separate such expressions by comma. For example in the form statement that begins

For (i=0,j=0;i<10;j=j-10,i++)

Sets up tow index variables I and j the former initialized to zero and the latter to 100 before the loop begins. Each time after the body of the loop is executed, the value of I will be incremented by 1.

Just as the need may arise to include more than one expression in a particular field of the form statement, so too may the need arise to omit on or more field from the for statements. This can be done simply by omitting the desired fields, but marking its place with a semicolon. The int expression field can simply be “left blank” in such a case as long as the semicolon is still included:

For (:j!=100:++j)

The above statement might be used if j were already set to some initial value before the loop was entered. A for loop that has its looping condition field omitted sets up an infinite loop, that is a loop that theoretically will be executed for ever.

**Example program**

**/\***The following is an example that finds the sum of the first fifteen positive natural numbers\*/

#include<stdio.h> // include stdio.h file

Void main()

{

Int I; //declare variable

Int sum=0,sum\_of\_squares=0; //declare and initialize variable .

For (i=0;i<30;i+=2) //for loop

{

Sum+=I; //add the value of I and store it to sum

Sum \_of\_squares+=i\*I; //find the square value and add it to sm\_of\_squares

} // ends of for loop

Printf(“Sum of first 15 positive even number=%d\n”,sum);//print sum

Printf(“sum of their square=%d\n”, sum\_of\_square); // print sum\_of\_square

}

* **The While statement:**

The simplest of all looping structure in C is the while statement.

The general format of the while statement is:

While (test condition)

{

Body of the loop

}

Here the given test condition is evaluated and if the condition is true than the body of the loop is executed. After the execution of the body, the test condition is once again evaluated if is true, the body is executed once again. This process of repeated execution of the body continues until the test condition finally becomes false and the control is transferred out of the loop. One exit, the program continues with the statements immediately after the body of the loop. The body may have one or more statements. The braces are needed only if the body contained two are more statements.

**Example program**

/\*for generating ‘N’ Natural number using while loop;\*/

Include<stdio.h>// include to stdio.h file

Void main() // start of your program

Int n, i=0; //Declare and initialize the variables

Printf(“Enter the upper limit number”) // Message to the user

Scanf(“%d”,&n); // read and store the number

While (i<=n ) // While statement with condition

{

// body of the loop

Printf(“\t %d”,i) // print the value of i

I++; // increment I to the next natural number

}

}//end of main

In the above program the looping concept is use to generate n natural. Here n and I and declared as integer variables and I is initialized to value zero. A message is given to the user to enter the natural number till where he wants to generate the numbers. The entered number is read and stored by the scanf statement. The while loop then checks whether the value of I is less than n i.e. the user entered number if it is true then the control enters the loop body and prints the value of I using printf statement and increments the value of I to the next natural number this process repeats till the value of I becomes equal to or greater than the number given by the user.

* **The Do while statement**

The do while loop is also a kind of loop, which is similar to the while loop in contrast to while loop, the do while loop tests at the bottom of the loop after executing the body of the loop. Since the body of the loop Is executed fires and then the loop condition is checked we can be assured that the body of the loop is executed at last once.

The syntax of the do while loop

Do

{

Statement;

}

While (expression);

Here the statement is executed, then expression in evaluated. If the condition expression is true then the body is executed again this process continues till the condition expression becomes false. When the expression becomes false.

When the expression becomes false the loop terminates

* **The Break Statement:**

Sometime while executing a loop it become desirable to skip a part of the loop or quit the loop as soon as certain condition occurs, for example consider searching a particular number in set or 100 numbers as soon as the search number is found it is desirable to terminate the loop. C language permits a jump from 0one statement to another within a loop as well as to jump out of the loop. The break statement allows us to accomplish the task. A break statement provides an early ex, from for, while do and switch constructs. A break causes the innermost enclosing loop or switch to be exited immediately.

* **Continue statement:**

During loop operation it may be necessary to skip a part of the body of the loop under certain conditions. Like the break statement C support similar statement called continue statement. The continue causes the loop to be continued with the next iteration skipping any statement in between. The continue with the next iteration for format to the continue statement is simply:

**Example program**

Consider the following program that finds the sum of five positive integers. If a negative number is entered. The sum is not performed since the remaining part of the loop is skipped using continue statement.

#include <stdio.h>

Void main ()

{

Int i=1,num,sum=0;

For (i=0;i<5;i++) //for loop

{

Printf (“Enter the integer”);

Scanf (“%d”, &num)

If (num<0) //check whether the number is less than zero

{

Printf (“You have entered a negative number”);

Continue; // starts with the beginning of the loop

}//end of if

Sum+=num; //add and store sum to num

}//end of for loop

Printf(“The sum of positive numbers entered=%d”, sum);

}//end of the program

**PRACTICE EXERCISE-4**

**1. The output of**

Main()

{

Int i-5,j=5;

While (j-->=3)

{

static int i=10;

printf (“%d,”, i++);

}

}

(a) 10, 11, 10, 12, 1 (b) 5, 6, 7, 8

(d) 10, 10, 10, 1 (d) None of these

**2. The output of**

Main()

{

Int x, y;

X=0x0F;

Y=0x0F;

while (x=y ^ x)

printf (“%d, %d”, x, y, y--);

printf(“%d”, x);

}

(a) 0, 16, 15, 15 (b) 16, 16, 15, 16

(c) 0, 16, 15, 15 (d) 0

**3. Consider the following program:**

main ()

{

Int c=50;

For(;c;)

c--;

printf(“ %d\n”,c);

}

The output of the program will be

(a) -50 (b) 50 (c) 0 (d) None

**4. Consider the following program**

mian()

{

Int x=0, I, j;

For(i=0,j=10,i<5,j>0;0+=2, j--)

++x;

printf (“%d”, x);

}

The output of the above program will be

(a) 10 (b) 0 (c) 5 (d) None

**5.**  #include <stdio.h>

Main()

{

Char ch= ‘A’;

While (ch<= ‘f’)

{

Switch (ch)

{

Case ‘A’: case ‘B’: case ‘C’: case ‘D’:

Ch++; continue

Case ‘E’: case ‘F’: ch ++;

}

Putchar (ch)

}

}

What will be the output of the above program?

(a) EFG will be displayed

(b) FG will be displayed

(c) ABCDEF will be displayed

(d) None of these

**6. What will be the value of r initial value of I, k and j are 2,-3,3- with reference to following program segment**

If ((i<0)&& (j>=0))

{

If (j==k);

T= ‘T’;

}

else

if (j==k)

T= ‘F’;

(a)-3 (b) F (c) T (d) 2

**7. What is the output of the following program fragment?**

{sum=0;

Do{

Scanf(“%d”,&i);

If(i<0){

I=-I;

++flag;

}

Sum+=I;

}while (i!=0);

}

(a) The sum of (flag-i) number of input number

(b) The sum of flag number of input numbers

(c) The sum of absolute value of input number

(d) None of the above

**8. What will be value of count after the following program is executed?**

Main()

{

Int count, digit=0;

Count=1;

While (digit<=9){

Printf (“%d\n”, ++ count );

++digit;}

(a) 10 (b) 9 (c) 12 (d) 11

**9. What will be the value of the sum after the following program is executed?**

Main()

{

Int sum, index;

Sum=1;

Index=9;

do{ index=index-1;

sum = 2\*sum;

}

While (index>9);

}

(a) 1 (b) 2 (c) 9 (d) 0.5

**10. How many times will the print statement b executed?**

Main()

Int n

N=10;

While(n<10){

Printf(“Hello!”);

--n;

}}

(a) never (b) once (c) 10 (d) 9

**11. If the following loop is implemented**

{

Int num;

Num=0;

Do{--num;

Printf(“%d”, num);

Num++;

} while (num>=0)

}

(a) The loop will run infinitely many times

(b) The program will not enter the loop

(c) There will be compilation error reported

(d) A run time error will be reported

**12. What is the final value of digit?**

Main()

{

Int digit;

For(digit=0;digit<=9; ++digit)

Printf(“%d\n”, digit);

Digit =2\*digit;

--digit;}

(a) 19 (b) -1 (c) 11 (d) None

**14. What it the value of ‘average’ after the following program is executed?**

Main()

Int sum, index;

Index=0;

Sum=0;

For(;){

Sum=sum + index;

++index;

If(sum>=100) break;

}

Average=sum/index;

}

(a) 91/14 (b) 91/13

(c) 105/15 (d) 105/14

**15. The flowing program fragment**

{

Int sum,index;

Indeed=5f0;

While (index>=0)

{

Sum=sum/index;

-index

}

}

(a) will give a run time error

(b) will give a compilation error

(c) will give a linkin error

(d) none of the above

**16. int u,v;**

While (v!=0)

{ t=v%du;

V=u; u=t;

}

Above piece of code

(a) find the G.C.D of u and b

(b) find the L.C.M u and b

(c) find remainder when u divides v

(d) none

**17. What is the following program line ?**

Main()

{

Int digit=0;

Do

Printf(“%d\n”,digit++);

While (digit<=9);

}

(a) Adding 9integer

(b)Adding integers form 1 to 9

(c) Displaying integers from 0 to 9

(d) Displaying integers form 1 to 9

**18. if c is a variable initialized to 1, how many time will be following loop be executed?**

While ((c>0)&&(( c<60)){

Loop body

C++;

}

(a) 61 (b) 59 (c) 60 (d) 1

**19. The for statement, which can precede a loop to be executed 50 times or till a Boolean variable found become false, is give by**

(a) for(i=0;i<50&&found==true; i++)

(b) for(i=0;i<50||found==false;++)

(c) for (i=0;i<50 && found==true;++)

(d) None of the above

**20. if ASCII value of ‘x’ is 120, what is the value of i=(‘x’-‘w’)/3**

(a) 2 (b) 1 (c) 0 (d) 4

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | D | 2 | D | 3 | C | 4 | A | 5 | B |
| 6 | B | 7 | C | 8 | D | 9 | b | 10 | A |
| 11 | A | 12 | A | 13 | A | 14 | C | 15 | A |
| 16 | A | 16 | A | 17 | D | 18 | B | 19 | A |
| 20 | c |  |  |  |  |  |  |  |  |

ARRYS 14

Arrays are a collection of item (i.e. ints, floats, chars) whose memory is allocated in a contiguous block of memory.

Arrays of any type can be formed in C. The syntax is:

Type name[dim];

A simple array of 5 ints would look like:

Int ai [5];

This would effectively make and area in memory (if available) for ia, which is 5\*size of (int). We reference areas of memory within the array by using the [] we can effectively “dereference” those areas of array to return values.

Printf(“%d”,ia[3]);

This would printf the **fourth** element in the array to the screen. Why is fourth? This is because array elements are numbered form 0.

**Not:-** You cannot initialize an array a variable. For example.

Int x=5;

Int ia[x];

Both of this work. The first one, ia is 10 bytes long with 8 bytes initialized to 0, 1, 3, 4. The second once is also valid, 6 bytes initialized to 0, 2, 1.

**Example of Array.**

/\*Introducing array’s\*/

#include<stio.h>

Main()

{

Int numbers [100];

Float average [20];

--numbers [2];

Printf (“The 3rd element of array numbers is %d\n”, numbers[2]);

}

Sample program output

The 3rd element of array number is

The above program declares tow arrays, assigns 10 to the 3rd element 0f array numbers, decrements the value (-- numbers [], and finally prints the value. The number of element that each array is to have is included the square brackets).

* **Character Arrays**

A string constant, such as

“I am a string”

Is an array of characters? It is represented internally in C by the ASCII characters in the string, i.e, “I”, blank, “a”. “m”……. for the above string, and terminated by the special null character “\0” so programs can find the end of the string.

String constant are often used in making the output of co9de intelligible using printf:

Printf (“Hello, world\n”);

Printf (“The value of a is: %f\n”, a);

String constants can be associated with variables. C provides the char type variable, which can contain one character -- at a time. A character string is stored in an array of character type, one ASCII character per location. Never forget that, since strings are conventionally by the null character “\0”, we require one extra storage location in the array.

**Example program**

# include<stdio.h>

Main()

{

Static char name 1[] = {‘H’, ‘e’, ‘l’, ‘l’, ‘o’};

Static char name 2[]= “Hello”;

Printf (“%s\n”, name1);

Printf (“%s\n”, name2);

}

Sample program output

Helloxghifghikoqw30-=k1”

Hello

The different between the two arrays is the name2 has a null placed at the end of the string, ie, in name2 [5], while mane1 has not. This can often result is garbage character being printed on the end. To insert a null at the end of the name1 array, the initialization can be changed to,

Static char name1 [] = {‘H’, ‘e’, ‘l’, ‘o’, ‘\0’};

* **Two Dimensional Arrays:**

Often there is a need to store and manipulate two dimensional data structure such as matrices & tables. Here the array has two subscripts. One subscript denotes the row & the other column. The declaration of two dimension arrays is as follows

Data\_type array\_name [row\_size][column\_size]

Here m is declared as a matrix having 10 row (numbered from 0 to 9) and 20 columns (numbered 0 through 19). The first element of the matrix is m[0][0] and the last column is m[9][9].

* **Initialization to two dimensional arrays:**

Int igrid [3][3] = {{0, 1, 2}, {3, 4, 5}};

Int igrid [2][3] = {0, 1, 3, 4, 5};

Int igrid [][4] = {{0, 1, 2, 3}, {4, 5, 6, 7}, {8, 9}};

* **Elements of two dimensional arrays:-**

A 2 dimensional array marks [4][3] is shown figure. The first element is given by marks [0][0] contains 35.5 & second element is marks [0][1] 40.5 and so on.

|  |  |  |
| --- | --- | --- |
| Marks [0][0]  35.5 | Marks [0][1]  40.5 | Marks [0][2]  45.5 |
| Marks [1][0]  50.5 | Marks [1][1]  55.5 | Marks [1][2]  60.5 |
| Marks [2][0] | Marks [2][1] | Marks [2][2] |
| Marks [3][0] | Marks [3][1] | Marks [3][2] |

It is mandatory to0 specify number of columns is tow dimensioned array.

* **Multi Dimensioned Arrays**

C allows arrays of three or more dimensions. The compiler determines the maximum number of dimension.

The general form of a multidimensional array declaration is :

Data type array\_name[s1][s2][s3]……[sn];

Where’s is the size of the ith dimension. Some examples are

Int survey [3][5][12];

Float table [5][4][5][3];

Survey is a 3 dimensional array declared to contain 180 integer elements. Similarly table is a four dimensional array containing 300 elements of floating point type.

* **Array:: Limitations**
* No Arrays Out of Bound Checking. From example

int ia[2] = {0, 1 };

printf(“%d”,ia[2]);

the above code would **default,** because you are trying to loo, at an area of memory not inside the array memory allocation.

* Array Size Must be Constant or Known at Com;ile-time.
* Arrays cannot be Copied or Compared. Why
* Array Index Type must be Integral.
* Another limitation comes with arrays being passed into functions. Take for example:

Void func (int ia[])

Void func (int \*ia)

Both are the same declaration; because only the pointed to the array is passed in, not the whole array. So what if you mistakenly did a sizeof (ia) inside func? Instead of returning the sizeof the whole array, it would only return the of a single element in the array.

**PRACTICE EXERCISE-5**

**1.** int test array [3][2][2] ={1, 2, 3, 4, 5, 6, 7, 8,};

What value does testarry[2][1][0] in the sample code above contain?

(a) 3 (b) 5 (c) 7

(d) 9 (e) 11

**2.** int I,j;

Int ctr=0;

Int my Array[2][3];

For (i=0;i<3; i++)

For (j=0;j<2;j++)

{

My Array [j][i]=ctr;

++ctr;

}

What is the value of myArray [1][2]; in the sample code above?

(a) 6 (b) 2 (c) 3

(d) 4 (e) 5

**3. Short setarray [4][3] = {{1}, {2, 3},{4, 5, 6}};**

Printf(“%d\n”,sizeof(testarray));

Assuming a short is two bytes long, what will be printed by the above code?

(a) It will not compile because not enough initialized are given.

(b) 6 (c) 7 (d) 12 (e) 24

**4. int y[4] = {6, 7, 8, 9};**

Int \*ptr=y+2;

Printf(“%d\n”, ptr[1]);/\*ptr+1==ptr[1]

What is printed when the sample code above is executed?

(a) 6 (b) 7 (c) 8 (d) 9

(e) the code will not compile

**5. char txt [20]= “Hello world!\0”;**

How many bytes are allocated by the definition above?

(a) 11 bytes (b) 12 bytes

(c) 13 bytes (d) 20 bytes

(e) 21 bytes

**6. int a [8]= {0, 1, 2, 3};**

The definition of a above explicitly initializes its first four definition. Which one of the following describes the complier treats the remaining four elements?

(a) Standard (C) defines this particular behavior as implementation-dependent. The compiler writer has the freedom to decide how the remaining elements will he handled.

(b) The remaining elements are initialized to zero (0).

(c) It is illegal to initialize only a portion of the array. Either the entire array must be initialized. Or no part of it may be initialized.

(d) As with an enum; the compiler assigns values to the remaining elements by counting up form the last explicitly initialized elements. The final four elements will acquire initialized. The final four elements will acquire the values 4, 5, 6 and 7, respectively.

(e) The are left in an initialized state; their value cannot be relied upon.

**7. How many of the following declarations are correct?**

Int i=7,0;

Double void =0.000

Short array [2] ={0,1,2};

Char c=”\n”;

(a) None (b) One is correct

(c) Two are correct (d) Three are correct

(e) All four are correct

**8. Consider the following program fragment:**

Int block []={13, 2, 5, 8};

Block [4]=15;

Which one of the following sentence is true?

(a) The code will cause compile-time errors.

(b) The code will compile but not run.

(c) The code will compile and run but may produce incorrect results.

(d) The code will compile and will always run properly.

(e) The code will compile and run, but may damage the computer’s memory.

**9. Consider the following program fragment:**

Int table[2][4],I,j;

For(i=0;i<2;i++) for(j=0;j<4;j++)

Table [i][j]=i+j;

Which one of the following sentence is true?

(a) The code of the following sentence is true?

(b) The code will compile but cause run-time errors.

(c) The value of table [1] [3] will be set to 4

(d) The value of table [3][1] will be set to 4.

(e) The value of table [0][0] will be set to 2.

**10. How many of the following string declaration are correct?**

Char sting1= “Hello”;

Char sting2 [] = “Hello”;

Char sting3 [5] = “Hello”;

Char sting4 [6] = {‘H’, ‘e’, ‘I’, ‘I’, ‘o’,’\0’};

(a) None (b) One is correct

(c) Two are correct (d) There are correct

(e) All four are correct

**11. An array is best described as**

(a) a garbage collection algorithm

(b) a collection of data items of the same type

(c) a simple variable

(d) data items of different types stored in the same memory location.

(e) a way of mixing primitive types and reference types.

**12. if you don’t initialize a static, what would be the elements set do?**

(a) 0

(b) an undetermined value

(c) a floating point number

(d) the character constant ‘\0’;

**13. what would be the output of the following program.**

Main()

{

Char c[2]= “A”

Printf(“\n %c”, c[0]);

Printf(“n\n%s”,c);

}

(a) A A

(b) Error as C[0] is not assigned any value

(c) Error as C does not have any value

(d) None

**14. What would be the output of the following program?**

Main()

{

Int a[5]={5, 1, 15, 20, 25};

Int I, j, k=l , m;

I=++a[1];

J=a[1]++;

M=a [I ++]

Printf (“\n %d %d %d”, I, j, k)

}

(a) 2, 2, 1 (b) 3, 2, 1

(c) 2, 2, 2 (d) 5, 1, 1, 5

**15. What would be the output of the following program?**

Main ()

{

Int three [3][]= {2,4,6,2,2,3,1,};

Printf (“%d”, three [1][1];

}

(a) 2 (b) 6 (c) 8 (d) Error

**16. Main()**

{

Char a[5\*2/2]={‘a’, ‘b’, ‘b’, ‘c’, ‘d’, ‘(e)’};

Printf(“%d\n”, a[-3]);

}

(a) y (b) a

(c) No output (d) Error

**17. Main ()**

{

Static char city [20]= “Nagpur”.

Int i=0;

While (i[city])

Printf(“%c”, city [i++]);

}

(a) Nagpur (b) Error

(c) City (d)None of the

**18. main ()**

{

Printf (5+ “Good morning”);

}

(a) Good Morning (b) Morning

(c) Error (d) 5 Good Morning

**19. What would be the output of the following program.**

#include(stdio.h)

Main()

{

Int a[]={1,2,3,4};

Int x=2;

Printf(“%d%d”,a[x],x[a]);

}

(a) 2,3 (b) 3,3

(c) syntax error (d) logical error

**20. Main();**

{

Printf(“%c”, “abcdefgh”[4]);

}

(a) abcd (b) abcdefgh4

(c) d (d) error

**21. if int a[3] has address 1023, then the address of int a [10] will be \_\_\_\_\_\_\_\_ int is 2 bytes long.**

(a) 1033 (b) 1037 (c) 1040

(d) cannot be calculated

**22. What would happen when the following program is executed?**

Main()

{

Int [3]={1,2,3};

Printf(“%d”,a[5]);

}

(a) Compile theme error

(b) Runtime Error

(c) Garbage value

(d) No Result

**23. A string always end with \_\_\_\_\_\_\_**

(a) Space

(b) “\n” new line character

(c) Alphabet

(d) “\0” null character

24. What is the different between the 5’s in these two expressions?

Int num[5];

Num[5]=11;

(a) First is particular elements, second is type

(b) First is array size, second is particular element

(c) First is particular element, second is array size.

(d) both are same

**25. Which of following declarations is invalid?**

(i) int a[25]; (ii) int size=10, b[size]

(iii) int c{0;1}

(a) (i) & (iii) (b) (iii) only

(c) (ii) & (iii) (d) all of the a

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | E | 2 | E | 3 | E | 4 | D |
| 5 | D | 6 | B | 7 | A | 8 | C |
| 9 | C | 10 | C | 11 | B | 12 | A |
| 13 | A | 14 | B | 15 | D | 16 | C |
| 17 | A | 18 | B | 19 | B | 20 | C |
| 21 | B | 22 | C | 23 | D | 24 | B |
| 25 | c |  |  |  |  |  |  |

**Answers:-**

FUNCTIONS 15

A **Function** is block of code that has a name and it has property that it is reusable i.e. it can be executed from as many different point in a C program as required. Function groups a number of program statement into a unit and gives it a mane. This unit can be invoked form other parts of a program. A compute program cannot handle all the tasks by itself. Instead its requests other program like entities- called function in C – to get its tasks done. A function is a self contained block of statement that performs a coherent task of same kind.

The name of the function is unique in a C Program and is Global. It means that a function can be accessed from any location within a C program. We pass information to the function called **arguments** specified when the function is called. And the function either returns some value to the point it was called form or returns nothing. Using function we can structure our programs in a more nodular way, accessing all the potential that structured programming can offer to us in C.

* **Structure of Function**

The general form of a function definition in C++ is as follows.

Function-type function-name (parameter-list)

{

Local-definition;

Function-implementation;

}

There are two main parts of the functions. The function header and the function body.

Int sum(int x, int y)

{

Int ans=0; //holds the answer that will be returned

Ans=x+y; //calculate the sum

Return ans //return the answer

}

* **Function Header**

In the first line of the above code

Int sum (int x inty)

It has three main parts

* The name of the function i.e. **sum**
* The parameters of the function enclosed in parenthesis.
* Return value type i.e. **int**
* **Function Body**

Whatever is written with in {} in the above example is the body of the function.

* **Function Prototypes**

The prototype of a function provides the basic information about a function which tells the compiler that the function is used correctly or not. It contains the same information as the function header contains. The prototype of the functions is the above example would be like.

Int sum (int x, int y)

The only difference between the header and the prototype is the semicolon; there must the semicolon at the end of the prototype.

* **Function Declaration**

When you declare a function, you specify the type of result it returns. If the function does not return a value, then your declare it to return a void type.

You can also declare the types of the arguments that the functions expects. Your write a list of one or more declarations separated by commas and enclosed within the parentheses of function decoration. If the function does not expect any arguments, you write only keyboard void.

**For example:**

Void result(void) **no argument, no return**

Double base\_val(void) **no argument, double return**

If the function expects a fixed number of arguments. You declare a corresponding **function parameter** of each of them. you list the parameter declarations in the sameorder that the arguments appear ina call to the function. You can omit the names of any of the parameters if you are not also defining the function .

Void seed (int val); **one int argument**

Int max (int, int);  **two int argument**

**Example** of function with no return type and no arguments

#include<stdio.h>

Void cube()

{

Int x,y;

Printf(“Enter a number”);

Scanf(“%d”,&x);

Y=x\*x\*x;

Printf(“\n The cube of %d is %d”,x,y);

}

**Example of function with return type and argument**

#include<stdio.h>

Int subtraction (int , int b)

{

Int r;

r=a-b;

return r;

}

Int main ()

{

Int x=5,y=3,z’

Z=subtraction (7,2);

Printf(“The first result is %”);

Printf(“the second result is %d\n”, subtraction (7,2));

Printf(“The third result is %d\n”, subtraction (x, y));

Z=4+subtraction (x, y);

Printf(“The fourth result is %d\n”, z);

return 0;

}

}

**Out put**

The first result is 5

The second result is 5

The third result is 2

The fourth result is 6

* **Arguments passed by value by reference.**

Until now, in all the function we have seen, the arguments passed to the function have been passed by value. This means that when calling a function with parameters, what have passed to the function were copies of their values but never the variables themselves. For example, suppose that we called our first function addition using the following code:

Int x=, y=3, z;

Z=addition (x,y);

What we did is this case was to call to function addition passing the values of x and y, i.e. 5 and 3 respectively, but any modification to either a or b within the function addition will not have any effect in the value of x and y outside it, because variables x and y were not themselves passed to the function, but only copies of their values at eh moment the function was called.

But there might be some cases where you need to manipulate form inside a function the value of an external variable. For the purpose we can use argument passed by reference, as in the function duplicate of the following example:

* **Passing parameter by reference**

#include <stdio.h>

Void duplicate (int&a, int&b, int&c)

{

A\*=2

B\*=2

C\*=2;

}

Int main ()

{

Int x=1, y=3, z=7;

Duplicate (x, y, z);

printf (“x=%d, y=%d, z=%d”, x, z, y);

return 0;

}

The first thing that should call you attention is that in the declaration of duplicate the type of each parameter was followed by an ampersand sign (&). This ampersand is what specifies that their corresponding arguments are to be passed by reference instead of by value.

When a variable is passed by reference we are not passing a copy of its vale, but we are somehow passing the variable itself to the function and any modification that we do the local variables will have an effect in their counterpart variables passed as arguments in the functions.

Void duplicate (int & a, int & b, int & d)

↕X ↕Y ↕Z

Duplicate (X, Y, Z )

To explain it in another way, we associate a, b and c with the arguments passed on the function call (x,y and z) and any change that we do on a within the function will affect the value of x outside it. Any changes that we do on b will effect y, and the same with c and z. that is why our program’s output, that show the value stored in x, y and z after the call to duplicate, show the values of all three variables of main doubled.

If instead of declaring the following function:

Void duplicated (int & a, int & b, int & c )

We had declared it this way:

Void duplicate (int a, int b, int c)

i.e., without the ampersand sings (&) we would have not passed the variables by reference, but a copy of their values instead, and therefore, the output on screen of our program would have been the values of x, y and z without having been modified.

* **Recursive functions**

**Recursion,** in mathematics and computer science, is a method of defining function in which the function being depend is applied within its own definition. The term is also used more generally to Describe a process of repeating objects in a self-similar way.

**Example program**

Function factorial (n)

{

If (n<=1)

return 1;

else

return n\*factorial(n-1);

}

The function calls itself recursively on a smaller version of the input (n-1) and multiplies to result of the recursive call by n, until reaching the base case, analogously to the mathematical definition of factorial.

* **Library function**

Library functions are generally not available to us in source form. Argument type checking is accomplished through the use of header files (like stdio.h) which contain all the necessary information. The following list briefly describes the function defined by various header files.

* **Cyte.h**

This defines a set functions that can be used to determine the type of a character. The function are

**Function name Function action**

Isalnum() Non-zero for a letter or number

Isalapha() Non-zero for a letter

Iscntral() Non-zero for a control character

isdigit() Non-zero for a digit

isgraph() Non-zero for a printing character (excl .pace)

inlower() Non-zero for a lower case letter

insprint() Non-zero for a printing character (incl. space)

ispunct() Non-zero for any printing character excluding space, letter and numbers

isspace() Non-zero for whitespace character including space, form feed, new line, carriage return, horizontal tab and vertical tab.

Insupper() Non-zero for upper case letter

* **Coni.h**

They include file stdio.h contains a number of useful function declaration, macros and defined constant. Many of these are concerned with file handling out the following are more generally useful.

**Function name Function action**

getchar() Get character form standard input. This is usually a macro.

gets() Gets string form standard input

printf() formatted write to standard output

putchar() Puts character to standard output. This is usually a macro

puts() Puts string to standard output.

scanf () formatted read form standard input

sprintf() Formatted write to store

sscanf() Formatted read form store

* **Math.h**

They include file contains prototypes for a useful set of mathematical functions.

**Function name Function action**

acos() Computer are cosine of x

asim() Computer are sine of x.

atan() Computer are tangent of x.

astan2() Computer are tangent of y/x.

ceil() Get smallest integral value that exceeds x.

cos() Compute cosine of angle in radians.

Div\_t div() Divide one integer by another.

Exp() Compute exponential of x.

fabs() Compute absolute value of x.

Floor() Get largest integral value less than x.

Fmod() Divide x by y with integral quotient and return reminder.

Frexp() breaks down x into mantissa and exponent of no.

Labs() Find absolute value of long integer n.

Log () Compute log (x)

Log 10() Compute log to the base.

Modf() Breaks x into fractional and integer parts.

Pow() Compute x raised to the power y.

Sin() Compute sine of angle in radians.

Sqrt() Compute square root of x.

Tan() Compute tangent of angle in radians.

Tanh() Compute the hyperbolic tangent of x.

* **String.h**

They include file includes prototype for the following library function

**Function name Function action**

Strcpy() Copy a string from one area to another. The use of this function was. Illustrated earlier.

Strcat() Concatenate strings the use of this function was illustrated earlier.

Strcmp() Compare strings. The use of this function was illustrated earlier. The return value of this function positive or negative depending on the difference of the first pair of characters that differ that are found in the strings beings compared.

Strchr() Search a string for a particular character. This function takes two parameter the first is the sting to be searched and the second is the character to be searched for. The return value is a pointer to the first occurrence of the character within the string of NULL if the character was not found.

Strstr() Looks for a string as a sub-string of another string.

Strlen() Determines the length of a string. The use of this function was illustrated earlier.

**THE C PREPROCESSOR**

The **C Preprocessor** is not part compiler, but is a separate step in the compilation process. In simplistic terms, a C Preprocessor is just a text substitution tool. Preprocessor is a way of making text processing with your C program before they are actually compiled. Before the actual compilation of every c program it is passed through a preprocessor. The preprocessor look through the program trying to find out specific instructions called preprocessor directives that it can understand All preprocessor directives being with the # (has) symbol.

All preprocessor lines begin with #. The unconditional directives are:

* #include – Inserts a particular header from another file.
* #define – Defines a preprocessor macro
* #undef - Undefined a preprocessor macro
* #pragma – defines beginning or end point of program.

The conditional directive is:

* #ifdef – if this macro is defined
* #ifndef - if this macro is not defined
* #If-Test if a compile time condition is true
* #else – The alternative for #if
* #elif - #else an #if in one statement
* #endif – Ene preprocessor conditional
* **#define**

The #define directive is used to define values of macros that are used by the preprocessor to manipulate the program source code before it is compiled. Because preprocessor definitions are substituted before the compiler acts on the source code, any errors that are introduced by # define are difficult to race.

* **Format**
* #define identifier replacement-text.
* #define PI3.14159

Macro without arguments are treated like a symbolic constant. In Macro with arguments: arguments substituted for replacement text

**Example program**

#define CIRCLE\_AREA(X) (PI\*(X)\* (X))

Are CIRCLE\_AREA (4);

Becomes

Area = (3.14159\*(4)\*(4));

Multiple arguments

#define RECTANGLE\_AREA(x, y) ((x)\* (y))

RectArea = ARECTANGLE\_AREA (a+4, 6+7);

Becomes

rectArea=((a+4)\*(b+7));

* **Advantages**
* Takes no memory
* **Disadvantage**
* Name not be seen by debugger (only replacements text)
* Do not have specific data type
* Const variable preferred
* **#undef**

Undefined symbolic constant or macro

Can later be redefined

* **#include**

This directive cause one file to be included in another. The preprocessor command for file inclusion looks like this:

#include “filename”

And it simply cause the entire contents of **filename**  to be inserted into the source at that point in the program. Of course this presumes that the file being included is existing.

Actually there exits two ways to write #**include** statement. These are

#include “filename”

#include <filename>

The meaning of each of these forms is:

**#include “goto.c”**

This command would look for the file **goto.c** in the current directory as well as the specified list of directories as mentioned in the include search path that might have been set up.

**#include <got.c>**

This command would look for the file **goto.c** in the specified list of directories only.

* **#pragma**

The pragma (pragmatic information) directive is part of the standard, but the meaning of any pragma depends on the software implementation of the standard that is used.

* **Feature of Program Preprocessor**
* Action depend on compiler
* May use compile- specific option
* Unrecognized #programs are ignored.
* **if, else, elif, endif (conditional compilation)**

the #if command checks whether a controlling conditional expression evaluates to zero or nonzero, and excludes or includes a block of code respectively. For example:

#if I

/\*This block will be include\*/

#endif

#if 0

/\*This bloc will not be include\*/

#endif

This conditional expression could contain any C operator except for the assignment operators. Increment, and decrement. One unique operator used in preprocessing and nowhere else in the **defined** operator. It returns I if the macro name, optionally enclosed in parentheses, is currently defined: 0 if not.

The **#endif** command ends a block stated by #if , #ifdef, or #ifndef. The #elif command is similar to #if, except that it is used to extract one form a series of block of code

e.g. :

#elif /\*some expression\*/

#elif /\*another expression\*/

/\*The otional #else block is selected if none of the previous #if of #elif blocks are selected \*/

#endif /\*The end of the #if block\*/

* **ifdef, ifndef**

the #ifdef command is similar to #if, except that the code block following it is selected if a macro name is defined.

In this respect.

# ifdef NAME

Is equivalent to

#if defined NAME

The #ifndef command is similar to #ifdef, except that the test is reversed:

#ifndef NAME

Is equivalent to

#if !defined NAME

**PRACTICE EXERCISE-6**

**1. void mayFunc (int x)**

{

If (x>0)

myFunc (--x);

printf(“%d”,x);

}

Int main()

{

MyFunc(5)

Return 0;

}

What will the above sample code produce when executed?

(a) 1,2,3,4,5,5 (b) 4,3,2,1,0,0

(c) 5,4,3,2,1,0 (d) 0,0,1,2,3,4

**2. which one of the following provides conceptual support for function calls?**

(a) The system stack.

(b) The data segment

(c) The processor’s registers

(d) The text segment

(e) The heap

**3. Which one of the following will read a character form the keyboard and will it in the variables?**

(a) c=getc(); (b) getc(&c)

(c) c=getchar (stdio) (d) getchar (&c)

(e) c=getchar();

**4. #include<stdio.h>**

Int I;

Void increment (int i)

{

I++

}

Int main()

{

For (i=0;i<10;increment (i))

{

}

What will happen when the program above is compiles and executed?

(a) It will not compile

(b) It will print out: i=9;

(c) It will printf out: i=10;

(d) It will print out: i=11

(e) It will loop indefinitely.

**5. long factorial (long x);**

{

????

Return x\*factorial (x-1)

}

With what do you replace the ???? to make the function show above retune the correct answer?

(a) if (x== 0) return 0;

(b) return 1;

(c) if (x>=2) return 2;

(d) if (x==0) return 1;

(e) if (x<=1) return 1; {more probable}

**6. #include <stdio.h>**

{

Int x=0; static int y=0;

X++;Y++;

Printf(“%d -- %d\n”, x, y);

}

Int main()

{

Func()

Func()

Return 0;

}

What will the code above print when it is executed?

(a) 1 - 1 (b) 1 - 1

1 - 1 2 - 1

(c) 1 - 1 (d) 1 - 0

2 - 2 1 – 0

(e) 1 – 1

1 – 2

**7. int Fibonacci (int n)**

{

Switch (n)

{

Defult:

return (Fibonacci(n-1)+ Fibonacci (n-2));

case 1 :

case 2:

}

return 1;

}

The function above has flaw that may result in a serious error during some invocations. Which one of the following describes the deficiency illustrated above?

(a) For some values of n, the environment will almost certainly exhaust its stack space before the calculation completes.

(b) An error in the algorithm causes unbounded recursion of all values of n.

(c) A break statement should be inserted after each case. Fall-through is not desirable here.

(d) The Fibonacci () function includes calls to itself. This is not directly supported by standard C due to its unreliability.

(e) Since the default case is given first, it will be executed before any case matching n.

**8. Which one of the following will define a function they CANNOT be called from another source file?**

(a) void function () {..}

(b) extern void function () {….}

(c) const void function () {…..}

(d) private void function () {…..}

(e) static void function () {…….}

What would be the output of the question from **9-12**

**9. main()**

{

Prinyf(“\n only stupid’s use C? ”);

display ();

}

Display

{

Printf (“\n Fools too use C”);

Main();

}

(a) It will be executed infinite times Printing the statements.

Only stupid’s use C

Fools too use C

(a) It will give error as main() function cannot be called in another function.

(b) It will print the statements

Only stupid’s use C

Fools too use C

(c) It will print the statements

Only stupid’s use C

Fools too use C

(d) No output would be given.

**10. Main ()**

{

Int i=45,c;

C=check (i)

Printf (“\n%d”, (c));

}

check (int ch)

{

If (ch>=45)

return (100)

else

return (10\*-10);

}

(a) syntax error: Function should have a return type

(b) garbage value (c) 100 (d) 10\*10

**11. Main()**

{

Int =45,(c);

C=multiply (i\*1000);

Printf (“\n %d”, (c));

{

If (ch>=40000)

return (ch\10)’

else

return (10);

}

(a) 4000 (b) 10

(c) overflow error (d) garbage value

**12. Main()**

{

Int i=5,j=2;

Junk (I, j);

Printf(“\n% d %d ”, I, j);

Getch();

}

Junk (int I, int j)

{

I=i\*I;

J=j\*j;

}

(a) 25,4 (b) 4,25 (c) 2,5 (d) 5,2

**13. main()**

{

Int i=0;

I++;

If(i<=5)

{

Printf(“\n C is programming language ”);

exit ();

main();

}

}

Assume necessary header file are included

(a) Compile time error: Function exit () should have a prototype

(b) C is a programming language: this statement will be printed once

(c) Runtime Error: A function cannot be called in itself

**14. main()**

{

Static int i=0;

I++;

If(i<=5)

{

Printf(“\n %d”, i);

Main();

}

else

exit();

}

(a) It will print the numbering form 1-5

(b) It will print () infinite times

(c) No result will be displayed

(d) None of the above

**15. Which function would you use if a single key were to be received through keyboard?**

(a) scanf () (b) gets()

(c) getch() (d) getchar()

**16. If a function does not return any value its return types is\_\_\_\_\_\_\_\_\_\_\_\_\_**

(a) void (b) int (c) float (d) null

**17. main()**

{

Int k=35,z;

Z=func (k);

Printf(“z=%d”,z);

}

Int func (int m)

{

M++

return m;

}

(a) z=35 (b) z=37 (c) z=36 (d) z=38

**18. What is wrong with the following function int fun1( int m[],int n)**

{

Int I;

For (i=0;i<n;i++)

M[i]=-m[i];

}

1. a variable cannot e assigned a negative value
2. you cannot pass array to function
3. a function cannot return an array
4. None errors

**19. A recursive function is oe…………..**

(a) which repeats itself

(b) which contains another function in itself

(c) which calls main() function in itself

(d) which contains loops

**20. The C function by default returns\_\_\_\_\_\_\_value**

(a) void (b) no value

(c) string (d) int

**Answers:-**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1** | **D** | **2** | **A** | **3** | **E** | **4** | **E** | **5** | **E** | **6** | **E** | **7** | **A** |
| **8** | **E** | **9** | **A** | **10** | **C** | **11** | **B** | **12** | **D** | **13** | **B** | **14** | **A** |
| **15** | **C** | **16** | **A** | **17** | **D** | **18** | **C** | **19** | **A** | **20** | **d** |  |  |

POINTERS AND OTHER C FUNDAMENTALS 16

**POINTERS**

* **Deification**

Pointer is a variable, which contain address of another variable. Address here is the address of memory location string form when the memory is allocated to the variable. Pointers provide and indirect method of accessing variables. Pointers are indirect references.

A pointer when declared is just a reference. Declaring a pointer does not create any space for the pointer to point to. A pointer is references to an area of memory in the heap. The heap is a dynamically allocated area of memory where the program runs.

**Declaration and Syntax.**

* Pointer are declared by using the \* in form of the variable identifier. Foem example:
* Int \*ip
* Float \*fp=NULL

The declares a pointer, ip, to an integer. The second line declar3es a pointer to float, but initializes the pointer to point to the NULL pointer. The NULL pointer points to a place in memory that cannot be accessed. NULL is useful checking of r error condition and many functions return NULL if they fail

Int x=5;

Int \*ip;

ip=&x;

we first encountered the & operator first in the I/O section. The & operator is to specify the address-of x. Thus, the pointing to x by assigning the address of x. This brings up the question, if prints contain addresses, then how do i get the actual value of what the pointer is pointing to? This is solved through the \* pointer. The \* **deference’s** the pointer to the valueprintf (“%d%d\n”, x, \*ip);would print 5 5 to the screen.

**There is a critical difference between a dereference and a pointer declaration:**

Int x=0, y=5, \*ip=&y;

And

X=\*ip

The statement in t \*ip=&y; is different than x=\*ip; the first statement does not dereference, the \*signifies to create a pointer to an int. The second statement uses deference.

* **Void Pointers**
* Void pointers can be assigned to any pointer value. It sometimes necessary to store/copy/move pointer without regard without regard to the type it references.
* You cannot dereference a void pointer.
* Function such as malloc, free, and scanf utilize void pointers.
* **Pointer Asthmatic**

C is one of the few languages that allow pointer arithmetic. In other words, you actually, move the pointer reference by an arithmetic operation. From example:

Int x=5, \*ip[=&x;

Ip++;

One a typical 16-bit machine,\*ip would be pointing to 5 after initialization. But ip++; increments the pointer 16-bits or 2-byte. So whatever was in the next2-bytes, \*ip would be pointing at it Pointer arithmetic is very useful when dealing with arrays, because arrays and pointer share a special relationship in C . More on this when we get to arras!.

* **Pointer and Arrays**

C allows pointer arithmetic (addition and subtraction). Suppose we have.

Char array[5];

Char \*array….ptr = &array [0];

In this example, \*array\_ptr is the same as array[0], \*(array\_ptr+1) is the same as array[1], \*(array \_ptr +2) it the same as array [2], and so on. However, (\*array\_ptr)+1 is not same are array[1]. The +1 is outside the parentheses, so it is added after the dereference. So is added after the dereference. So (\*array\_ptr)+1 is the same as array [0]+1. The elements an array are assigned to consecutive address. For example, array[0] may be placed at address 0xff000024. The array [1] would be placed at address 0xff000024, and so on. This structure means that a pointer can be used to find each element of the array.

C blurs the distinction between pointers and arrays by treating them in the same manner in many cases. Here we use the variables array as a pointer, and C automatically does the necessary conversion. When before the array, C will issue a warning.

* **Pointers and Functions**

We can simulate call by reference using pointer,

/\*swap function using pointers:\*/

Void swap (int \*x, int\*y)

{

Int tmp;

tmp = \*y;

\*x=\*y;

\*y=tem;

}

Int main ()

{

Int a=2,b=3;

Swap (&a, b&);

return EXIT\_SUCCESS;

}

This snip of swapping code works. When you call swap, you must give the address-of a and b, because swap is expecting a pointer. Why does this work? It’s because you are giving the address-of the variable. This memory does not “to away” or get “popped off” after the function swap ends. The changes within swap change the value located in those memory addresses.

We can pass function as parameters into function. This can be done using a reference, or pointer, passed into the function. On a pointer to a function.

Such pointer have syntax as

Int (\*func\_ptr)

Means is. That func\_ptr is a pointer to a functions, which returns as int. consider a function int display()

To assing the address of display to the pointer func\_ptr we my do:

Func ptr\_display

add to invoke the function we are just required to write the statement,

(\*fun\_ptr)()

* **Dynamic Memory Allocation Using Pointers**

Dynamic allocation is a pretty unique feature to C (amongst high languages). It enables us to create data types and structures of any size and length to suit our programs need within the program. It is implemented using pointers

* **Malloc and Free**

The Function **malloc** is most commonly used to attempt to grab a continuous of memory. It is define by:

void \*malloc(size\_t number\_of\_bytes).

That is to say it return a pointer of type void \*that is the start in memory of the reserved portion of size number\_of\_byte. If memory cannot be allocated a NULL pointer is returned. Since a void \* is returned the C standard states that this pointer can be converted to any type. The size\_t argument type is defined in stdlib.h and is an unsigned type.

So:

Char \*cp;

Cp=malloc (100);

Attempts to get 100 bytes and assigns the start address to cp.

Also it is usual to use the sizeof () function to specify the number of bytes:

Int \*ip;

Ip= (int \*) malloc (100 \*sizeof (int));

Some C compilers may require to cast that type of conversion. The (int\*) means conversion to an integer pointer.

When you have finished using a portion of memory you should always free it. This allows the memory freed to be available again, possible for further malloc() calls. The function **free** () takes a pointer as an argument and frees the memory to which the pointer refers.

* **Calloc and Realloc**

There are two additional memory allocation functions, Calloc() and Realloc(). Their prototypes are given below:

void \*calloc(size\_t num\_elements, size\_t elemet\_size);

void \*realloc(void \*ptr, size\_t new\_size);

malloc does not initialize memory (to zero ) in any way. If you wish to initialize memory then use calloc. Calloc there is slightly more computationally expensive but, occasionally, more convenient then malloc. Also note the different syntax between calloc and malloc in that calloc takes the number of desired elements, num elements and elements\_size, as two individual arguments.

Thus to assign 100 integer elements that are all initially zero you would do:

Int \*ip;

Ip=(int\*) calloc (100, sizeo(int));

Realloc is a a function which attempts to change the size of a previous allocated block of memory. The new size can be large of smaller. If the block is made larger than the old contents remain unchanged and memory is added to the end of the block. If the size is made smaller then the remaining contents are unchanged.

* **Pointer Review**
* Pointer is an indirect reference to something else. They are primarily used to reference items that might dynamically change size at run time.
* Pointer have special operator, & and \*. The & operator gives the address-of a pointer. The dereferences the pointer (when not used in a pointer declaration statement).
* You must be careful when using const type qualifier. You have to to also be cautious about eh void pointer.
* C allows pointer arithmetic, which gives the programmer the freedom to move the pointer using simple arithmetic. This is very powerful, yet can lead to disaster if not used properly.

**STUCTURES IN C**

A structure is a collection of variable under a single name. These variables can be of different types, and each has a name which is used to select it from the structure. A structure is a convenient way of grouping several pieces of relate information together. A structure can be defined as a new named type, thus extending the number of available types. It can use structure, array of pointer as a new named type, thus extending the number of available types. It can use structure, array of pointer as some of its members, though this can get complicated unless you are careful.

* **Defining a Structure**

A structure type is usually defined near to the start of a file. It usually occur just after the #define and #include statement in a file.

Here is an example structure definition.

Struct student

{

Char name[64];

Char course[128];

Int age;

Int year;

}s;

This defines a new type student variable of type student can be declared as follows:

Student rec;

This is similar to declaring an int or float. The variable name is st\_rec, it has members called name, course, age and year.

* **Accessing Members of a Structure**

Each member of a structure can be used just like a normal variable, but its name be a bit longer. To retune to the example above, member name of structure st\_rec behave just like normal arrays of char, however we refer to in by the name St rec.name

Here the dot is an operator which selects a member from structure.

* **Pointer to Sturcts**

Sometimes it is useful to assign pointer to structures. Declaring pointers to structure is basically the same as

declaring a normal pointer:

struct student \*student\_a;

we can dereference the pointer to the struct and its fields in two ways, the fires way is:

printf(“%s\n”,(\*student\_a).SSN);

This would get SSN in student\_a;

To dereference, you can use the infix operator:->. The above example using the new operator:

printf(“%s\n”,student\_a->SSN);

* **Uses of Structures**
* A structure is a good way of strong related data together. It is also good way of representing certain types of information.
* Structures could be used to hold the locations of pointers in multi-dimensional space. Mathematicians and engineers might see a storage efficient implementation for spares array here.
* Apart from holding data, structures can be used as members of other structures. Arrays of structures are possible, and are a good way of storing list of data with regular fields, such as database.
* Another possibility is a structure whose fields include pointer to its own type. These can be used to build chains (programmers call these linked lists), tree or other connected structures.

**UNIONS**

Unions are declared in the same fashion as structs, but have a fundamental difference. Only on item within the Union can be used at any time, because the memory allocated for each item inside the union is in a shared Memory location. An example:

Union feels\_like

{

Float wind\_chill;

float heat\_index;

}

As you know, wind\_chill is only calculated when it is “cold” and heat\_index when it is “hot”. There is no need for both. So when you specify the temp in today, feels like only has one value, either a float for wind shill or float for heat\_index.

* Types inside of unions are unrestricted; you can even use structs within unions.

**ENUMERATED TYPES**

An **enumerated type** is an abstract data type, each of whose values take on exactly one of a finite set of identifiers chosen by the programmer. Enumerated types are typically use for categorical variable (like the suit of a cart), which do not have any numerical order. At run-time, enumerated types are often implemented using integers

(each identifier has a distinct integer value).

enum day {mon, tues……sun} week;

enum days week 1, week2;

like array first enumerated name has index value 0. So mon has value 0, tuse1, and so on .

we can also override the 0 start value;

enum months {jan=1, mar,,,,,…. dec};

here it is implied that feb=2 etc.

**BIT FIELDS**

**Bit fields** allow the packing of data in a structure. This is especially useful when memory or data storage is at a premium. Typical examples:

* Packing several objects into a machine word. E.g 1 bit flags can be compacted- symbol tables in compilers.
* Reading external file formats-non-standard file formats could be read in.

C lets us do this in structure definition by putting: bit length after the variable.i.e.

Structure packed\_struct{

unsigned int f1:I;

unsigned int f2:I;

unsigned int f3:I;

unsigned int type f4:I;

unsigned int fimmu\_int:9;

}pack;

Here the packed\_struct contains 6 members: four 1 bit flags f1: f3, a4 bit type and 9 bit funny int. access members as usual via:

Pack. Type=7;

C automatically packs the above bit fields as compactly as possible, provided that the maximum length of the fields is less than or equal to the integer would length of the computer. If this is not the case then some compilers may allow memory overlap of fields whilst other world store the next field in the next word.

The use of **typedef** is a simple macro-like facility for declaring new names for data types, including user-defined data types. Typical examples are show below:-

typedef long BIGINT;

typedef double REAL;

typedf struc POINT;

{

double x;

double y;

POINT;

}

Given the above declarations, it would be possible to write the following declaration:-

POINT a,b,c;

REAL a1,a2;

It should be emphasized that this does not create new types, it just re-names existing ones. Unlike preprocessor constructs the interpretation of typedefs is performed by the compiler so that checks can be made that typedefs are use correctly.

**STROAGE CLASSES**

Storage class include: auto, extern, and register, static.

* **Auto:** The auto keyword place the specified variable into the stack area of memory. this is usually implicit in mot variable declaration, e.g. int I;
* **Extern:** The extern keyword makes the specified variable access the variable of the same name form some other file. This is very useful for sharing variable in modular programs.
* **Register:** The register keyword suggests to the compiler to place the particular variable in the fast register memory located directly on the CPU. Most compilers these days (like gcc) are so smart the suggesting registers could actually make your program slower.
* **Static :** The static keyword is useful for extending the lifetime of a particular variable. If you declare a static variable inside a function, the variable remains even after the function call is long gone (the variable is placed in the alterable area of memory). The static keyword is overloaded. It is also used to declare variables to be private to a certain file only when declared with global variable, static can also be used with functions, making those functions variable only to the file itself.

**COMMAND LINE ARGUMENTS**

In C it is possible to accept command line arguments. Command-line arguments are given after the name of a program in command-line operating systems like DOS of Linux, and passed in the program form the operating system. To use command line arguments in your program, you must first understand the full declaration of the main function, which previously has accepted no arguments. In fact, main can argument is a full list of the command line arguments full declaration of main looks like this:

In main (int argc, char \*argc[])

This integer, argc is the argument count. It is the number of arguments passed into the program from the command line, including the name of the program. The array of character pointers is the listing of all the arguments. Argv[0] is the name of the program of an empty sting, if the name is not available. After just like a string, or use argv as tow dimensional array, argv[argc] is null pointer.

**Example program**

The program is called arg1.

Main(int argc, char \*argv[])

{

Int i=0;

Printf(“%d command line arguments\n”, argc);

do

printf(“Argument %d=>>%s<<\n”,I argv [i]);

while(++i<argc)

}

And typical examples of use

Agr 1 a b c

4 command line arguments

Argument 0=>>arg1<<

Argument 1=>>a<<

Argument 2=>>b<<

Argument 3=>>c<<

**The symbols “>” and “<<” are used to make the limits of the strings clear in the output**

**PRACTICE EXERCISE-7**

**1. consider the following program char oadd (char c)**

{

Return & c;

}

Void ost (char \*cad; char val)

{

\*cad=val;

}

Main()

{

C

har a= ‘A’, b= ‘B’ sot (oadd (a),b);

Printf(“value of a =%\n”, a);

}

Which of the following is true for the above program?

(a) program print “Value of a =”B

(b) program print “Value of a =A”

(c) This program constants a syntax error

(d) None of these

**2. What does the following program segment print?**

Main()

{

Int I;

Int iarray [4]={1,2,3,4};

#define SIZE (sizeof(iarray)/sizeof(int))

for (i=0;i<SIZE; ++I)

iarray [i]+=2;

Printf(“Values is % (d)\n”,iarray[3]);

}

(a) Compilation error because of #define within main module

(b) 6 (c) 3 (d) None

**3. Consider the following program segment**

Main()

{

Char c\_arry [] = {‘A’, ‘B’, ‘C’, ‘D’}, \*ptr;

\*ptr=c\_arry

\*++ptr=\*(c\_arry +2);

Printf (“c=%c”, \*ptr+1);

}

The output of the above program segment is

(a) C (b) D (c) A (d) None

**4. Consider the following program segment**

Main(“\*)

{

Int n=2, \*ptr;

Prt=&n;

N\*=3;

Printf(“%d\n”,\*ptr\*\*ptr);

}

The above program segments prints

(a) 6 (b) 36 (c) 4 (d) None

**5. What is the output of the following program segment?**

Main()

{

Val=5;

Call\_cunc 1 (val);

Printf(“The Output is: %d\n”, val);

}

Call\_func 1(val)

Int val:

{

Return (cal\_func2(val\*2));

}

Call\_func2(val)

Int val:

{

Return (val);

}

(a) 5 (b) 20 (c) 10 (d) None

**6. Which one of the following statement is true after execution of the program?**

nt tap 10],I,\*p

a[0]=1;

a[1]=2;

p=a;

(\*p)++;

(a) a[0]=2 (b) a[1]=3

(c) a[[1]=2 (d) all

**7. #define max (x, y) x=(x > y)? x; y is a maro definition, which can find the maximum of two numbers x and y, if**

(a) x and y are both integers

(b) x and y are both declared as float

(c) x and y are both declared as double

(d) All of these are true

**8. #define two (x) 2\*x**

**#define ddouble (x) x +x**

Main()

{

Int num, sum, product;

Num=1;

Sum =--two (num); -- sum;

Product =-- ddouble (num);

Printf(“%d %d\n”, sum, product)j;

}

The output of the above program is

(a) 00 (b) 01 (c) 11 (d) 10

**9. The declaration typedefs float height [100];**

Height men, women;

(a) Define men and women as 100 element floating point arrays

(b) Define height, men and women as floating point variables.

(c) Define men and women as floating point variables

(d) Are illegal

**10. Consider the following declarations:**

Typedefs struct {

Char name [20];

Char middlename [5];

Char surname [20];

} NAME

NAME class [20];

(a) Class is a new type

(b) Class is an array of 20 names where each name consists of a name, middlename and surname

(c) Class is an array of 20 characters only

(d) None of these

**11. Consider the following declaration**

Stuct list {

Int x:

Struct list \*next;

} \*head;

The statement head. X=100

(a) Creates a head of the list

(b) Creates a node to type list and assigns a value to x

(c) assigns 100 to one element of the structure list

(d) is an erroneous statement

**12. A short integer occupies 2 bytes, an ordinary integer 4 bytes and a lone integer occupation 8 bytes of memory. A structure is defined as follows:**

Struct TAB {

Short a;

Int b;

Long c;

} TABLE [10]

Then, the total memory requirement for TABLE IS

(a) 40 (b) 140 (d) 14 (d) 24

**13. What is the value of u 1 and u 2?**

Int u 1, u 2;

Int v =3;

Int\*pv;

U 1= 2\* (v+5)

Pv=&v;

u2=2\*(v +5)

(a) u 1=16,u2=16 (b) u 1=16,u2=3

(c) u 1=8, u2=16 (d) u 1=8,u2=3

**14. The declaration**

Union id {

Char color [12];

Int size;} short, pant;

Denotes shirt and pant are variable of type is and

(a) shirt and pant are the same as struct variables

(b) each can represent either a 12-character color or integer size at a time

(c) each can have a value of color and size

(d) variables shirt and pant cannot be used simultaneously in a statement

**15. Consider the following declarations:**

Union id I{

Char clor;

Int size;

}

Struct {

Char country

Int date;

Union id I id;

} flag;

To assign a color to a flag, the correct statement will be

(a) flag, color = ‘white’;

(b) flag.id.color = ‘W’;

(d) flag id.color= ‘White’;

**16. Consider the following declaration enum color {black, blue, green};**

This represents

(a) black=0, blue =1, green=2

(b) color= ‘black’ or color = ‘blue’ or color = ‘green’

(c) color [1]= ‘black’, color [2] = ‘blue’; color [3] = ‘green’

(d) None o

**17. What are the output of the following program?**

Main(**)**

**{**

Int u=1; int v=3;

Void funct 1(into, int v);

Void funct 2(int \*pu, int \*pv);

Printf(“u=%d,v=%d”,u,v);

Funct1(u,v);

Printf(“u=%d, v=%d”,u,v);

Funct2(&u,&v);

Printf(“u=%d,v=%”,u,v);

}

Funct1(int u,intv)

{

U=u+v;

V=u-v;

U=u-v;

{

Funct2(int\*pu,int&pv)

{

\*pu=\*pu+\*pv;

\*pu=\*pu-\*pv;

\*pu-\*pv

}

(a) u=1 v=3 u=3 v=1 u=1 v=3

(b) u=1 v=3 u=3 v=1 u=3 v=1

(c) u=1 v=3 u=1 v=3 u=1 v=3

(d) u=1 v=3 u=1 v=3 u=3 v=1

**18 A pointer is a/an**

(a) address of a variable

(b) variable for storing address

(c) indication of the variable t b accessed next

(d) None of above

**19. static int \*(\*name [])**

(a) name is array 0 pointer to functions returning pointer to static integer

(b) name is function returning pointer to array of pointer to static integer

(c) name is a static array of pointer to function returning pointer to integer.

(d) None of these

**20. if you continuously increment a variable, it will become negative?**

(a) True (b) False

(c) It depends on the variable type

(d) It will lead to fininty

DATA STRUCTURES 17

A data structure is a way of storing data in compute so that it can be used efficiently. Often a carefully chosen data structure will allow a more efficient algorithm to be used. The choice of the data structure often being from the choice of an abstract data structure. A well-designed data structure allows a variety of critical operations to be performed, using as few resources, both execution time memory space, as possible. Data structures are implemented using the data types, references and operations on them provided by a programming language. Different kinds of data structures are suited to different kind of applications, and some are highly specialized to certain tasks.

In the design of many types of programs, the choice of data structures is a primary design consideration, as experience in building block of most data structure are arrays, records, discriminated unions, and references. For example, the null able reference, a reference which can be null, is a combination of references and discriminated unions, and discriminated unions, and the simplest linked data structure, the linked list, is built form records and null able references.

The data structure, like an array, whose number of element must be specified before it is used, it called **static data structure.** Such data structure cannot accommodate more value than its specified capacity.

A **dynamic data structure,** on the other hand, is a data structure whose number of elements need not be specified before it is used. It can increase an decrease to accommodate varying numbered elements. More number of data members may be added and delete as and when required. This dynamic nature of a data structure is achieved by the use of the concept of pointer.

* **Time And Space Complexity Of Algorithms**

The analysis of algorithms is a major task in Computer Science. In order to compare algorithm, we must have some criteria to measure the efficiency of our algorithm. The total needed by any algorithm in execution and memory space required by the algorithm is the two main measures for the efficiency of any algorithm.

To determine the execution time the following information is required:

* The Machine we are executing on.
* Its machine language instruction set.
* The time required by each Machine instruction.
* The translation a compiler will make form the source to the Machine language.

But choosing a real machine and existing compiler even if hypothetical algorithms (with imaginary executions times) is designed there would be t he problem of compiler, which could vary from machine to machine. All these considerations lead us to limit our goals.

Another approach is called the **Frequency count approach.** In this approach the time is measured by counting the number of key operations. Key operations of any algorithm are operations or steps which are not to be excluded from the algorithm. We count only key operations because time for the other operations is much less than or at the proportional to the time for the key operations.

The space is measured by counting the maximum of memory needed by the algorithm.

**LINKED LIST**

A **linked list** is one of the fundamental data structures used in computer programming. It consists of a sequence of nodes, each containing arbitrary data fields and one or two references (“links”) pointing to the next and \ or previous nodes. A linked list is a self-referential data types because it contains a pointer or link to another data of the same type. Linked lists permit insertions and removal of nodes to any. Point in the list in constant time, but do not allow random access. Several different types of linked list exist: singly-linked lists, doubly-linked lists, and circularly-linked lists.

* **Single-linked list**

The simplest kind of linked list is a **singly-liked list (**or list for short**)**. Which has one link per node? This link points to the next node in the list, or to null value or empty list if it is the final node.

A singly linked list containing three integer value

* **Double-linked list**

**99**

**12**

A more sophisticated kind of linked list is a **double-linked list** or **two-way linked list.** Each node has two links: one points to the previous node, or pointers to a null value or empty list if it is the first node; and one points to the next, or points to a null value or empty list it its is the final node.

Head node \*prev data \*next

56

46

26

NULL

* **Circularly-linked list**

In a **circularly-linked list,** the first and final nodes are linked together. This can be done for both singly and doubly linked list. To traverse a circular linked list, you begin at any node and follow the list in either direction until you return to the original node. Viewed another way, circularly-linked lists can be seen as having or end. This type of list is most useful for managing buffers for data ingest, an in case where you have one object in a list and wish to see all other objects in the list. The pointer pointing to Representation of linked list.

Because each node of an element contains two part we have to represent each node through a structure. While defining linked list we must have recursive definitions:

Struct node

{

Int data;

Struct node \*ptr;

}

Link is a pointer of struct node type i.e. it can hold the address of variable struct node type. Pointer permits the referencing of structure in a uniform way, regardless of the organization of the structure being referenced. Pointer is capable of representing a much more complex relationship between elements of a structure than a linear order.

* **Traversal:**

Traversing list is simple, just query the data part of the node for pertinent information as you move form next to next.

Say for example:

Struct node \*ptr;

Ptr=head;

Ptr=ptr\*>next;

**STACK**

* A stack is similar in concept to a pile of plates, book, boxes, etc.
* The first item put on the stack is on the bottom of the stack.
* All items added to the stack are placed on top of the stack.
* Stacks are called Last-in First-out (LIFO) data structure.
* The last plate put on the top of the stack is the first plate removed from the stack.
* The first plate put on the top of the stack is the last plate removed from stack.

A stack is an ordered list in which all insertions and deletions are made end, called top. Given a stack=S(a[1].a[2]),……….a[n] then we say that a 1 is the bottommost element and element a[i] is on top of element a[i-1],1<i<=n. when viewed as a queue with a[n] as the rear element on says that a[i+1] is behind a[i],1<i<=n.

E

D

C Top

B

A

A restriction on a stack imply that if the elements. A,B,C,D,E are added to the stack, n that order, then the first element to be removed/delete must be E. Equivalently we say that the last element to be inserted int the stack will be first to be remove. For this reason stacks are sometimes referred to as last in first out (LIFO) list. The behavior of putting an item on the stack is called **push**. The behavior of removing and item form the stack is called **pop.**

* **Characteristics of stacks:**
* Data can only be placed on the top of the stack.
* Data can only be removed from the top of the stack.
* Data can only be removed from the bottom f the stack if there is only one item on the stack.
* Data can **not** be removed for the middle of the stack without first removing all item form the top.

**QUEUES**

In providing services in computer science, transport, and operation research a **queue** (pronounced ‘Q’) is a buffer abstract data structure where various entities such as data, objects, persons, or events are strode and waiting to be processed. The most well known operation of the queue is the First-In-First-Out (FIFO) queue process-In a FIFO queen, the first element in the queue will be the first one out; this is equivalent to the requirement that whenever an element is added, all elements that were added before have to be removed before the new element can be invoked. Unless otherwise specified, the remainder of the article will refer to FIFO queues. There is also non-FIFO queue data structure, like priority queues.

Queues is implemented using **front & Rear. Front is used to delete values form Queue. Rear is used to insert values in Queue.**

**Front Rear**

**A B C D E**

There are two basic operations associated with a queue: enqueue and dequeue. **Enqueue** means adding a new item to the rear of the queue while **dequeue** refers to removing the front queue and returns it in item.

A practical implementation of a queue of course of course does have some capacity, that depends on the concrete situation it is used in. for a data structure the executing computer will eventually run out of memory, thus limiting the queue size. Queue **overflow** results from trying to add an element onto a full queue and queue **underflow** happens when trying to remove an element for an empty queue.

When we represent any Queue through an Array, we have to predefine the size of Queue, and we cannot enter more elements than that predefined size, say MAX.

Initially Rear=FRONT=0;

Similarly: Condition for empty queue is

FRONT == Rear

Whenever an element is added to the Queue the value of Rear is increased by 1; this can be implemented.

as :

Rear=Rear+1;

Or

Rear ++;

Provided that Rear is less than MAX-1, which is the condition for full Queue.

Whenever an element is added from the Queue, the value of FRONT is increased by 1; this can be implemented by following assignment.

FRONT=FRONT+1;

* **Circular queue**

When next element to Rear of a list is the FRONT, it known as circular list. Because we have to Reset value of Rear and FRONT for MAX-1 to 0 while inserting or deleting elements we cannot do by

REAR=REAR+1 and

FRONT=FRONT+1

Instead we can do this by following assignment:

REAR=(REAR+1)%MAX and

FRONT=(FRONT+1)%MAX

Which increments the REAR and FRONT from 0 to MAX- and when needed resets them form MAX-1 to 0. Similarly, conditions for Empty and Full Queues also cannot be as before.

Instead we have to assume that, Queue will be empty when.

REAR=FRONT

And full when,

(REAR+1)%MAX=FRONT

* **Deque**

A Deque (short for double-ended queue)is an abstract data structure from which elements can be added to or removed from the front or back, this differs from a normal queue, where elements can be only be added to one end and removed from the other. Deque is usually pronounced deck. Possible due to the conceptual similarity to deck of cards, where a card can be dealt from or returned to either the face or patterned aide. **Priority queue** is an abstract data supporting the following three operations: add an elements to the queue with an associated priority remove the element from the queue that has the highest priority and return it (optionally) peek at the element with highest priority without removing it.

The simplest way to implement a priority queue data type is to keep an associative array mapping each priority to a list of element with that priority. If association list are used to implement the associative array, adding an elements takes constant time but removing or peeking at the element of highest priority takes linear (O(n)) time, because we must search all keys for the largest on.

**TREES**

A **tree** is a widely-used data structure that emulates a tree structure with a set of linked nodes. Each node has zero or more **child nodes,** which are below it in the tree (by convention, tree grows down, not up as they do in nature). A node that has a child is called the child’s **parent node** or ancestor node, or superior. A node has at most one parent.

* **Basic terminology about trees**
* **Definition of Tree:**

A tree is a finite set of one or more nodes such that is a specially designated node called the Root and remaining nodes are partitioned into n>0 disjoint sets S1…………….S n where each of their sets is a tree. S1…….S n are called the sub tree of the root. The condition that S 1……S n disjoint sets prohibits sub tree form ever connecting together.

* **Node:** A node stands for the item of information plus the branches to other items.
* **Degree:** The number of sub tree of a node is called its degree.
* **Leaf of Terminal Nodes:** Nodes that have degree zero is called leaf of Terminal nodes.
* **Children:** The roots of the sub trees of a node 1 are called the children of node 1. I am the ‘parent’ of its children.
* **Siblings:** Children of the same parent are called ‘Siblings’
* **Level:** The set of all nodes at a given depth is sometimes called a **level** of the tree. The ‘level’ of a node is defined by initially letting the root be a level 1. If a node is at level 1, then its children are at level1+1.
* **Height or Depth:** The height of depth of a Tree is defined as the maximum level of any node in the Tree the **depth** of a node n is the length of the path form the root to the node.
* The **height** of a tree is the length of the form the root node to its furthest leaf.
* **Forest:** A ‘forest’ is set of n>0 disjoint trees.

The topmost node in a tree is called the **root node.** Being the topmost node, the root node will not have parents. It is the node at which all operations on the tree being. All other nodes can be reached from it by following edges or links.

A **sub tree** is a portion of a tree data structure that can be viewed as a complete tree in itself . Any node in a tree T, together with all the nodes below it, comprise a sub tree of T. the sub tree corresponding to the root node is the entire tree the sub tree corresponding to any other node is called a proper sub tree (in analogy to the term proper subset).

Node at the bottom most level of the tree are called **lead nodes.** Since they are at the bottom most level, they will not have any children. An **internal node** or **inner node** is any node of a tree data structure that has child nodes and is thus not a leaf node.

There are two basic types of trees. In a **unordered tree,** a tree is a tree purely structural sense- that is to say, given a node, there is no order for the children of that node. A tree an which an order is imposed---- for example, by assigning different natural numbers to each child of each node-is called an **ordered tree,** and data structures built on them are called ordered tree data structures. Ordered tree are by far the most common form of tree data structure.

* A **directed edge** refers to the link form the parent to the child (the arrows in the picture of the tree).
* If a path exists form node p to node q, then p is an **ancestor** of and q is a **descendant** of p.
* The **size** of a node is the number of descendants it has including itself.

**Common uses form trees are to:**

* Manipulate hierarchical data;
* Make information easy to search
* Manipulate sorted list of data
* **Binary Trees**

A binary tree is a finite set of elements that is either empty of is partitioned into three disjoint subsets. The first subset contains single elements called the Root of the tree. The other two subsets are themselves Binary Trees, called the left and right sub trees of the original tree. A left or right sub tree can be empty. A node of a Binary Tree can have at most two Branches.

If A is the roof of a Binary Tree and B, C are the roots of its left and right sub trees respectively them A is said to be the father of B , C and B are called Left and Right Sons respectively. If every Non Leaf node in a Binary Tree has Non Empty Left and Right sub tree is termed as Strictly Binary Tree. A **Strictly Binary Tree** with n leves always contains 2n-1nodes.

**A Complete Binary Tree or A perfect binary tree** a Strictly Binary Tree of depth ‘d’ whose all leaves are at level d. a **complete binary tree** may also be defined as a full binary tree in which all leaves are at depth n or n-1 for some n. in order for a tree to be the latter kind of complete binary tree, all the children on the last level must occupy the leftmost spots consecutively, with no spot left unoccupied in between any to

An  **almost complete binary tree** is a tree in which each node that has a right child also has a left child. Having a left child does not require a node to have right child. Started alternately, an almost complete binary tree is a tree where for a right child, there is always a left child, but for a left child there may not be aright child.

**Binary search trees** are one kind of ordered tree, and there is a one-to-one mapping between binary tree and general ordered trees.

A **full binary tree, or proper binary tree,** is a tree in which every node has zero or two children.

**The maximum number of nodes on Level I of a Binary Tree is 2i-1, i>1.**

**The maximum number of nodes on a binary tree of depth k is 2k-1 k>1**

* **Binary Tree traversal**

**Per-order (prefix) traversal**

In pre-order, each node is visited before any of its children.

**Post-order (postfix) traversal**

Similar to the per-order is the **post order-** where each node is visited after all of its children. In both cases, values in the left sub tree are printed before values in the right sub tree.

**In-order (infix) traversal**

An **in-order** traversal visits each node after in visits the nodes of its left sub tree but before visiting the nodes of its right sub tree. This is a particularly common way of traversing a binary search tree,

because it gives the values in increasing order.

**Examples:**

In this binary tree

D=data, L=left,R=right

* Preorder (DLR) traversal yields: A,H,G,I,F,E,B,C,D
* Post order (LED) traversal yields: G,F,E,IH,D,C,B,A
* In order (LDR) traversal yields: A,H,B,G,I,C,F,F,D

**GRAPH**

A **graph** is a kind of data structure, specifically an abstract data type (ADT), that consist of a set of nodes and a set of edges that establish relationship (connections) between the nodes. The graph ADT follows directly from the graph concept form mathematics.

A graph G cons8ist of a non empty set V called the set of nodes (points, vertices) of the graph, a set E, which is the set of the graph and mapping form the set of edges E to a pair of elements of V. a graph G is defined as follows: G=(V,E), where V is finite, non-empty set of vertices (singular: vertex) and E is a set of edges (like between Paris of vertices). When the edges in a graph have no direction, the graph is called undirected, otherwise called directed. In practice, some information is associated with each node and edge.

* **Terminology**

Any tow nodes, which are connected by an edge in a graph, are called “**adjacent nodes**”. In a graph G (V,E) an edge which is directed form one node to another is called a “**directed edge**”, which an edge which has no specific direction is called an “**undirected edge**”. A graph in which every edge is directed is called a “**directed graph**” **or a “digraph”.** A graph in which every edge is undirected is called an “**undirected graph**”. If some of edges are directed and some are undirected in a graph then the graph in called a “**mixed graph**”. Let (V,E) be a graph and x € E be a directed edge associated with the ordered pair of nodes (u,v), then the edge is said to “**initiating**” of “**originating**” in the node u and “**terminating**” or “**ending**” in the node y. the nodes u and b are also called “**initial or terminal**” nodes of the edge x. An edge x € E which joins the nodes u and v, whether it be directed or undirected is said to be “**incidents**” to the node u and v. an edge of a graph which joins a node to itself is called a “**loop**”.

In some directed as well as undirected graphs we may have certain pair of nodes joined by more than one edge. Such edges are called “**Parallel**”. Any graph which contains some parallel edges is called a “**multi graph**”. If there is no more than, such a graph is called “**simple graph**”. A graph in which weights are assigned to every edge is called a “**weighted graph**”. In a graph a node which is not adjacent to any other node is called “**isolated node**”. A graph containing only isolated nodes is called a “**null graph**”. In a directed graph for any node v the number of edges which have v as initial node is called the “**out degree”**. Of the node v. the number of edges to have v as the terminal node is called the “**in degree**” of v and Sum of oudegree and in degree of a node v is called its incident on v. the total degree of a loop is 2 and that of an isolated node is 0. Any sequence of edges of a digraph such that the terminal node of the edge if any, appearing next in the sequence define “**path**” of the graph. A path is said to traverse through the nodes appearing in the sequence originating in the initial node of the first edge and ending in the terminal node of the first edge and ending and terminal node of the last edge in the sequence. The number of edges in the sequence of a path is called the “**length**” of the path.

A path of a digraph in which the edges are destined is called **simple path (edge simple).** A path in which all the nodes through which traverse is done, are distinct is called “**elementary path (node simple)**”.

A path which originates and ends in the same node is called “**cycle (circuit)**”. A cycle is called “**elementary**” if it does not traverse through any node more than once.

In a directed graph each edges is represented by a directed pair <V1, V2>, V1 is the tail and V2 the head of edge. Thus <V2. V1> and<V1,V2 represent two different edges.

The number of distinct unordered Paris (Vi, Vj) with Vi ≠ Vj in a graph with n vertices is n\*(n-1)/2. This is the maximum number of edges in any n vertex undirected graph. An n vertex undirected graph. An n vertex undirected graph with exactly n(n-1)/2 edges is said to be complete.

* **Traversal**

Graph algorithms are a significant field of interest for compute scientists. Typical operations associated with graph are: finding a path between two node, like depth-first search and breadth-first search.

**Depth-first search (DFS)** is an algorithm for traversing of searching a tree, tree structure, or graph.. Intuitively, one starts at the root (selecting some node as the root in the graph case) and explores as far as possible along each branch before backtracking.

Formally, DFS is an uninformed search that progress by expanding the first child nod of the search tree that appears and thus going deeper and deeper until a goal node is found, or until it hits a node that has no children. Then the search backtracks, returning to the most recent node it hadn’t finished exploring. In a non-recursive implementation, all freshly expended nodes as added to a LIFO stack for expansion

Space complexity of DFS is much lower than BFS (breadth-first-search). Time complexity of both algorithms are proportional to the number of vertices plus then number of edge in the graph they traverse (O [V] + [E]).

For the following graph:

A depth-first search starting at A, assuming that the left edges in the shown graph are chosen before right edges, and assuming the search remembers previously-visited nodes and will not repeat them (since this is a small graph), will visit the noses in the following order: A,B,D,F,E,C,G

Performing the main search without remembering previously visited nodes results in visiting nodes in the order A,B,D,F,E,A,B,D,F,E etc. forever caught in the A,B,D,F,E, cycle and never reaching C or G.

**Breadth-first Search**

Breadth first search visits the nodes neighbors and then the unvisited neighbors of the neighbors etc. if it starts on vertex a it will go to all vertices that have an edge from a . if some points are not reachable it will have to start another BFS form a new vertex.

Graph Traversal

Graph

A Breadth-First Search visits nodes b u level in the tree Display of graph G that is

* First the room
* Then all nodes on level 1,
* Then all nodes on level
* ……….

On reaching previously visited nodes, the search in canceled for the current branch.

For implementation, we need a Queue.

Breadth-First Search

Directed Graph G

**SEARCHING IN ARRAYS**

Consider searching for a given value v in an array of size N. there are 2 basic approaches: **sequential search** and **binary search.**

* **Sequential search**

Sequential search involves looking at each value in turn (i.e. start with the value in array [0], then array [1], etc). the algorithm quits and return true if the current value is v; it quits and return false if it has looked at all of the values in the array without finding v. if the value are in **sorted** order, then than the algorithm can sometimes quit and return false without having to look at the values in the array; v is not in the array if the current value is **greater** the v.

The worst-case time for a sequential search is always O (N)

* **Binary search**

When the values are in sorted order, a better approach than the one give above is to use **binary search.** The algorithm for binary search stats by looking at the middle item x. if x is equal to v, it quits and return true. Otherwise, it uses the relative ordering of x and v to eliminate half of the array (if v is less than x. then it can’t be stored to the right of x in the array ; similarly, if it is greater than x. it can’t be stored to the left of x). Once half of the array has been eliminated, the algorithm starts again by looking at the middle item in the remaining half. It quits when it finds v or when the entire array has been eliminated.

The worst-case time for binary search is proportional to log2 N: the number co times N can be divided in half before there is nothing left. Using big-O notation, this is O(log N). Note that binary search in an array is basically the same as doing a lookup in a perfectly balanced binary-search tree (the root of a balanced BST is the middle value). In both case, if the current value is not one we are looking for. We can eliminate half of the remaining values.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| 7 | 10 | 13 | 13 | 13 | 165 | 19 | 19 | 23 | 28 | 28 | 32 | 36 | 37 | 40 | 41 |

Search the following array for 36.

1. (0+12)/2=7;a[7]=19;

Too small; search 8….15

2. (8+15)/2=11; a[11]=32;

To small; search 12….15

3. (12+15)/2=13; a [13] =37;

Too small; search 12……12

4. (12+12)/2=12; a [12] =36;

Value found…….

* Linear search has linear time complexity
* Binary search has logarithmic time complexity
* For large arrays, binary search is for more efficient than linear search
* However, binary search requires that the array be stored
* If the array is sorted, binary search is
* 100 times faster for an array of sixe 1000
* 50,000 times faster for an array of size 10,00,000

**SORTING**

Consider sorting the value in an array A of size N. Most sorting algorithms involve what are called comparison sorts; i.e. they work by comparing values. Comparison sorts can never have a worst-case running time less then O (N long N). Simple comparison sorts are usually O (n2); the more clever ones are O (N log N). There interesting issues to consider when thinking about different sorting algorithms are:

* Does an algorithm always take its worst-case time?
* What happens on an already-sorted array?
* How much space (other than the space for the array itself) is required?

Selection sort and insertion sort have worst-case time O (N2). Quick sort is also O(N2) in the worst case, but its expected is O(N long N). Merge sort is O (N log N) in the worst case.

* **Selection sort**

The idea behind selection sort is:

1. Find the smallest value in A; put it in A[0].

2. Find the second smallest value in A; put it in A[1].

3. Etc.

The approach is as follows:

* Use an outer loop form 0 to N-1 (the loop index, k, tells which position in A to fill next).
* Each time around. Use a nested loop (from k+1 to n-1) to find the smallest value (and its index) in the unsorted part of the array.
* Swap that value with a[k].

Note that after I iterations, A [0] through A [i-1] contain their final value (so after N iterations, A [0] through A[N-1] contain their final values and we’re done!)

Selection sort words as:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 5 | 0 | 5 | 4 | 1 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 5 | 0 | 5 | 4 | 1 |

Original array A K=0

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 0 | 5 | 5 | 4 | 1 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 0 | 5 | 5 | 4 | 1 |

K=1 K=2

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 0 | 1 | 4 | 5 | 5 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 0 | 1 | 4 | 5 | 5 |

K=3 k4

Final array A

X item to switch

X already sorted

When is the time complexity of selection sort? Not that the inner loop executes loop executes a different number of times each time around the outer loop, so we can’t just multiple N\* (time for inner loop).

However, we can notice that:

* 1st iteration of outer loop: inner executes N-1 times
* 2nd iteration of outer loop: inner executes N-2 times
* …………..
* Nth iteration of outer loop: inner executes 0 times

This is out old favorite sim:

N-1+N+2+…….+3+2+1+0

Which we know is O (N2)

What if the array is already sorted when selection sort is called? It is still O(N2); the two loops still execute the same number of times, regardless of whether are array is sorted or not.

* **Insertion Sort**

The idea behind insertion sort is:

1. put the first 2 items is correct relative order.

2. Insert the 3rd item in the correct place relative to the first2.

3. Insert the 4th item in the correct place relative to the first3.

4. etc.

After the it time around the outré loop, the items in A [0] through A[1-1] are relative to each other (but are not Necessarily in their final place). Also, note that in order insert an item into its place in the (relatively) sorted part of the array, it is necessary to move some value to the right to make room. Here’s a picture illustrating how insertion sort works on the same array used above for selection sort:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 5 | 0 | 5 | 4 | 1 |

Original array A

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 5 | 0 | 5 | 4 | 1 |

K=1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 0 | 5 | 5 | 4 | 1 |

K=2

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 0 | 5 | 5 | 4 | 1 |

K=3

K=4

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 0 | 1 | 4 | 4 | 5 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 0 | 4 | 5 | 5 | 1 |

Final array A

X item to insert

X where inserted item belongs

X already sorted

**SPARSE MATRIX**

The time complexity of insertion sort? Again, the inner loop can execute a different number to timer for every iteration of the outer loop. In the **worst** case:

* 1st iteration of outer loop: inner executes 1 time.
* 2nd iteration of outer loop: inner executes 2 times.
* 3rd iteration of outer loop: inner executes 3 times.
* ……………
* N-1st iteration of outer loop: inner executes N-1 times.

So we get:

1+2+…….+N-1

Which is still O (N2)?

The naïve data structure for a matrix is a two dimensional array. Each entry in the array represented an elements ajj of the matrix and can be accessed by the two indices I and j. for a n x m matrix we need at least (n\*m)/8 bytes to represent the matrix when assuming 1 bit for each entry.

A sparse matrix contains many (often mostly) zero entries. The basic ideal when storing matrices is to only store to non-zero entries a opposed to storing all entries. Depending on the number and distributi9on of the non-zero entries, different data structure can be used and yield huge sayings in memory when compared to a naïve approach.

One example of such a sparse matrix format is the (old) Yale Sparse Matrix Format [1]. It stores an initial sparse N x M matrix M in row from using three array, A IA, NZ, denotes the number of nonzero entries in matrix M. the array A then is of length NZ and holds all nonzero entries of M. The array IA stores at IA (i) the position of the first element of row I in the sparse array A. the length of row I is determined by IA (i+1)-IA(i). Therefore IA needs to be length N+1, in array JA, the column index of the element A (j) is stored. JA is of length NZ.

**PRACTICE EXERCISE-8**

**1. In linked list, the successive elements.**

(a) Must not occupy contiguous space in memory.

(b) Need not occupy contiguous space in memory.

(c) Must occupy contiguous space in memory.

(d) None of these

**2. Linear order in linked list is provided through**

(a) The implied position of the node.

(b) Index number

(c) position

(d) None of the above

**3. Null pointer is used to tell**

(a) The linked list in empty

(b) Empty poi8nter field of a structure

(c) End of liked list

(d) All of the above

**4. List pointer variable in lined list contains address of the**

(a) Current node in the list

(b) Following node in the list

(c) First node in the list

(d) None of these

**5. An underflow condition in a linked list may while attempting to**

(a) delete a non-existent node the list

(b) insert a new node where there is not free space for it

(c) delete a node in an empty list

(d) None of the above

**6. An overflow condition in linked list may occur while attempting to**

(a) Create a node when free space pool is empty

(b) Create a node when linked list it empty

(c) Transverse the nodes hen free space pool is empty

(d) None of the above

**7. Because of linear structure of linked list having natural linear ordering, there is similarity**

(a) Deletion of a node

(b) Insertion of a node

(c) Traversal of elements of list

(d) None of the above

**8. Searching a linked list requires linked list be created**

(a) Without underflow condition

(b) In any order

(c) In sorted order only

(d) None of the above

**9. Polynomial in memory may be maintained through a/an**

(a) stack

(b) one-dimensional array

(c) linked list with header node

(d) None of the above

**10. Get a node, store new element and insert the new node at the top refers to insert operation in a non-empty**

(a) stack (b) array

(c) queue (d) None

**11. “Get the value of most recently inserted node and delete the node” refers to operation**

(a) POP (b) EMPTY

(b) PUSH (c) None

**12. “FRONT REAR” point refers to empty**

(a) array (b) queue

(c) stack (d) None

**13. struct address {**

Char name [14]; struck address \*next } info;

Func (struct address \*i=0)

If (i==0) i=j;

Else i->next=j;

j->next=0;

i=j;}

builds the linked list by placing each element

(a) at the appropriate place in the list

(b) on the end

(c) in the beginning

(d) None

**14. struct address {**

Char name [40]; struct address \*next;

} info

Func (struct address \*head);

{ while (head){printf(head->name);

Head=head->next;}

}

Printf the

(a) name in all elements of linked list starting from the elements of the linked list

(b) name in element of linked list pointed by non-null head

(c) both (a) and (b)

(d) None of the above

**15. datatype \*s;**

Datatype \*p;

Datatype \*I;

P=nalloc (100); t=p; s=p+(100/size of (datatype))-size of (datatye);

{ if (p>s){printf(“Overflow\n”); return;}

\*p=j; p++;j

Is referring to the

(a) push operation of stack

(b) push operation of queue

(c) pop operation of stack

(d) None of the above

**16. which one of the following is not a required feature of a good hashing algorithm? It should**

(a) allow even distribution of records through the allocated space

(b) Be repeatable

(c) Minimize synonyms

(d) None

**17. The pre-order traversal of a binary tree begins with**

(a) Processing of the root node

(b) Traversal of the left sub tree in pre-order

(c) traversal of the right sub tree in pre-order

(d) None of the above

**18. which one of the following statement is true in view of threaded binary trees?**

(a) Deletion form a threaded tree is time consuming but insertion into it is not

(b) Both insertion into and deletions from a threaded tree are more time consuming

(c) Insertion into a threaded tree is time consuming but deletion from it is not

(d) None of the above

**19. which of the following statements is true in view of a multi way search tree? If a node has**

(a) 4 sub trees; it contains 3 key

(b) 6 sub trees; it contains 6 keys

(c) 5 key; it has 7 sub trees

(d) None of the above

**20. if in a given directed tree the out degree of every node is less than or equal to m, then it is called a/am**

(a) Complete binary tree

(b) Threaded binary tree

(c) m-ary tree

(d) None of these

**22. Which of the following statements is true in view of a threaded storage representation of a binary tree?**

(a) It’s in order threading is different from its post-order threading

(b) The number of thread links is reduced to zero

(c) The number of NULL links in a threaded tree is very small but it is not zero

(d) None of these

**23. If graph G has none of the above edges, then corresponding adjacency matrix is**

(a) Zero Matrixes

(b) Matrix with all 1’s

(c) Unit matrix

(d) None of these

**24. The worst case efficiency of binary search is**

(a) long2n (b) n2 (c) n (d) None

**25. What is not true for linear collision processing?**

(a) It may induce more collision

(b) it is easier to program

(c) It requires space for links

(d) All of the above

**26. Breadth first search**

(a) Scans all incident edges before moving to another vertex

(b) is same as backtracking

(c) scams adjacent unvisited vertex as soon as is possible

(d) None of these

**27. This sort does not use Divide and Computer methodology**

(a) Quick sort

(b) Merge sort

(c) Bubble sort

(d) All use divides and conquer methodology

**28. struct node \*nPrt, \*sPtr;/\* pointer for a linked list. \*/**

For(nPrt=sPrt; nPtr=nPtr->next)

{

Free (nPtrr);

}

The sample code above releases memory form a linked list. Which of the choices below accurately describes how it will work?

(a) It will work correctly since the for loop converse the entire list.

(b) It may fail since each node “nPtr” is freed before its next address can be accessed

(c) In the for loop, the assignment “nPtr=nPtr->next” should be changed to “nPtr. Next”

(d) This is invalid syntax for freeing memory

(e) The loop will never end.

**29. Which one of the following provides conceptual support for function calls?**

(a) The system stack

(b) The data segment

(c) The processor’s registers

(d) The text segment

(e) The heap

**30. One difference between a queue and stacks is**

(a) Queues require linked lists, but stack do not

(b) Stacks require linked list, but queue do not

(c) Queues use two ends of the structure; stacks use only one

(d) Stacks use tow ends of the structure, queue use only one.

**31. If the character ‘D’, ‘B’, ‘A’ are placed in a queue (in that order), and then removed one at a time, in what order will they be removed?**

(a) ABCD (b) ABDC

(c) DCAB (d) DCBA

**32. Suppose we have a circular array implementation of the queue, with ten items in the queue stored at data [2] through data [1]. The current capacity is 42. Where does the insert method place the new entry in the array?**

(a) Data [1] (b) data [2]

(c) data [11] (d) data [12]

**33. In the linked list implementation of the queue class, where does the insert method place the new entry on the linked list?**

(a) At the head (b) At the tail

(c) After all other entries that is greater than the new entry.

(d) After all other entries that is smaller than the new entry.

**34. If data is a circular array of CAPACITY elements, and rear in an index into that array, what is the formula for the index after rear?**

(a) (rear % 1)+ CAPACITY

(b) rear % (1+CAPACITY)

(c) (rear +1)% CAPACITY

(d) rear +(1% CAPACITY)

**35. I have implemented the queue with a circular array keeping track of front, rear, and many Items (the number of items in the array). Suppose front in zero, and rear is one less than the currents capacity. What can you tell me about mayItem?**

(a) mayItem must be zero.

(b) mayItesm must be equal to the current capacity.

(c) Count could be zero of the capacity, but no other values could occur.

(d) None of the above

**36. I have implemented the queue with a linked list, keeping track of a front node and a rear nod with two reference variables. Which of this reference variable will change during an insertion into a NONEMPTY queue?**

(a) Neither changes

(b) Only front changes

(c) Only rear changes

(d) Both changes.

**37. All complete binary trees with an odd number of nodes are also full binary tress.**

(a) True (b) False

**38. if a binary tree is threaded for an in-order traversal order, NULL left line of any node is replaced by the address of its**

(a) root (b) predecessor

(C) successor (d) None

**39. Which one of the following figures is not possible as a balance of any node of an AVL tree?**

(a) -1 (b) 1

(c) 0 (d) None

**40. The in-order traversal of some binary tree produced the sequence DBEAFC and post order traversal of the some tree produced the sequence DEBFCA. Which one of the following is a correct preorder traversal sequence?**

(a) ABEDFC (b) DBAECF

(c) ABDECF (d) None

**41. The in order traversal of some binary tree produced the sequence DBEAFC and the post order traversal of the sequence DEBFCA. What will be the total number of nodes in the sub-tree of the given tree?**

(a) 5 (b) 4

(c) 1 (d) None

**42. A balanced binary tree is a binary tree is which the heights of the two sub trees of every node never differ by more than**

(a) 3 (b) 5

(c) 2 (d) None

**43. What is the minimum number of keys contained in each non rot node of a B-tree order 11?**

(a) 3 (b) 5

(c) 4 (d) None

**44. The post-order traversal of some binary tree produced the sequence CD3FEA, and the another traversal of the same tree produced the sequence CBDAFE. What will be the total number of nodes in its right sub tree?**

(a) 2 (b) 4

(c) 3 (d) None

**46. Which of the following statements is true? A B-tree of order**

(a) 24 contains at last 12 keys in each no root node

(b) 24 contains at least 12 keys in each no root node

(c) 25 contains at least 12 keys in each non root node

(d) None of these

**47. The in- order traversal of some binary tree produced the sequence CBDA and post- order traversal of the same tree produced the sequence CDBA. Which one of the following statements is true for the given tree?**

(a) It’s both left sub tree and right sub tree must be non-empty

(b) Its left sub tree and right sub tree contains 3 nodes

(c) Its left sub tree is empty, and the total number of nodes in its right sub tree is 3

(d) None of the above

**48. Which one of the following statements is true in view of a thread binary tree? It can have**

(a) Thread links but no structural link

(b) Structural links but no thread link

(c) Thread links and can also have structural links

(d) None of the above

**49. A double linked list is declared as:**

Struct node

{

Itemtype item;

Nonde\* prev;

Node\* next;

}

Node\* head;

Which of the following segments of code removes neither the element pointed to by X form the doubly linked list, if it is assumed that X point to neither the first nor the last element in the list?

(a) X->prev->next=X->next;

X->next->prev=X->prev;

(b) X->next->next=X->prev;

X->next->prev=X->next;

(c) X->prev->prev=X->next;

X->next-> next =X->prev;

(d) X->prev-> prev =X->prev;

X->next->next=X->prev;

(e) X->prev-> =X->next;

X->next-> =X->prev;

**50. For maintaining order, insertions in a lexical ordered binary tree can only be performed at**

(a) a leaf level (b) a root node

(c) an intermediate level

(d) None of these

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | B | 2 | C | 3 | D | 4 | C | 5 | C | 6 | A | 7 | C | 8 | B | 9 | C | 10 | A |
| 11 | A | 12 | D | 13 | B | 14 | A | 15 | A | 16 | D | 17 | B | 18 | B | 19 | A | 20 | C |
| 21 | B | 22 | A | 23 | A | 24 | A | 25 | C | 26 | A | 27 | C | 28 | B | 29 | A | 30 | C |
| 31 | D | 32 | D | 33 | B | 34 | C | 35 | B | 36 | C | 37 | A | 38 | B | 39 | D | 40 | C |
| 41 | B | 42 | D | 43 | D | 44 | A | 45 | C | 46 | A | 47 | D | 48 | C | 49 | A | 50 | a |

**TEST YOUR KNOWLEDGE 2**

**1. It runs on computer hardware and serve as platform for other software to Run on**

(a) Operating system

(b) application software

(c) system software

(d) all of these

**2. It is the layer of a computer system between the hardware and the user program**

(a) Operating environment

(b) operating system

(c) System environment

(d) none of these

**3. The primary purpose of an operating system is**

(a) To make the most efficient use of the computer hardware

(b) To allow people to use the computer

(c) To keep systems programmers employed

(d) To make computer easier to use

**4. It transform one interface into another interface**

(a) Program (b) software

(c) data (c) none of these

**5. This system is built directly on the hardware**

(a) Environment (b) system

(c) operating (d) none of these

**6. Multiprogramming system**

(a) Are easier to developed than single programming system

(b) Execute each job faster

(c) Execute more jobs in the same time period

(d) Are used only one large mainframe computer

**7. It is first program run on a computer, when the computer boots up**

(a) System software (b) operating system

(c) system operating (d) none of these

**8. Which interface consists of things like program counter, registers, interrupts, and terminals?**

(a) hardware (b) software

(c) data (d) none of these

**9. It shares characteristics with both hardware and software**

(a) Operating system (b) software

(c) data (d) none of these

**10. It is used in operating system to separate mechanism form policy**

(a) single level implementation

(b) two level implementation

(c) multi level

(d) none of these

**11. Which was the last version of DM-DOS**

(a) 5.0 (b) 6.0

(c) 6.11 (d) 6.22

**12. Which file in MS DOS contains internal commands that are loaded during booting process?**

(a) IO.SYS

(b) MSDOS.SYS

(c) COMMAND.COM

(d) CONFIG.BAT

**13. What is the name of the batch file that is automatically tune when MS DOS is booted?**

(a) RUN.BAT

(b) CONFIG.SYS

(c) COMFIG.BAT

(d) AUTORUN.BAT

**14. Which type of commands in DOS needs additional files for their execution?**

(a) Internal command

(b) external command

(c) batch command

(d) redirector

**15. The TIME command is used to display**

(a) US time

(b) Greenwich mean time

(c) Julian time (d) system time

**16. Which switch should be used in the DIR command to view files in all directories?**

(a) /p (b) /w (c) /s (d)/l

**17. Which among the following are the best tools for fixing errors on disks?**

(a) FDIKS (b) SCANDISK

(c) CHKDSK (d) FIXDSK

**18. What is the switch that is used to make sure that the COPY command copies files correctly?**

(a) /A (b) /C (C) /S (d) /L

**19. Which of the following statements in regard to directories is false?**

(a) Directories can exist inside directories

(b) The root directory is always at the highest level

(c) Directories with file can be deleted

(d) Directories cannot be renamed

**20. Which command can be used to recreate the disks tracks and sectors?**

(a) FDISK (b) FORMAT

(C) CHKDSK (d) ATTRIB

**21. Which of the following statements is true in regard to DISK COPY?**

(a) COPY and DISKCOPY are same

(b) DISKCOPY is a built in command in DOS

(c) DISKCOPY can be used on hard disks

(d) DISKCOPY can be used with a floppy and hard disk

**22. FAT stands for**

(a) file accommodation table

(b) file access tape

(c) File allocation

(d) file activity table

**23. Which commands in DOS is used to display the version of MS DOS?**

(a) VEESION (b) VERIFY

(c) VER (d) VERSN

**24. Which of the following file names are invalid in MS-DOS**

(a) MYFILE.DOS (b)CHEK$. (1)

(c) VERIFIED.### (d)QWERTY.?3

**25. It is used to take the output of one command as input of another command**

(a) Redirection (b) pipe

(c) piping (d) direction

**26. Which command in DOS can be used to recover accidentally delete**

(a) UNDELETE

(b) DELETE/CANCEL

(C) RESTORE

(d) RECOVER

**27. Which command in DOS is used to set a name to a disk?**

(a) VOLUME (b) VOL

(c) LABEL (d) DIR/AH

**28. which of the following commands display names file in sorted order?**

(a)DIR/N (b) DIR/SO

(c) DIR/AN (d) DIR/ALL

**29. Which command displays the list of all previous command entered by the User?**

(a) COMMADS/ALL (b) KEYDOS

(c) DOKEY (d) DIR/ALL

**30. IN MS-DOS 6.22,which part identifies the product uniquely**

(a) MS (b) DOS

(C)MS-DOS (d) 6.22

**31. In MS-DOS what command you will used to display system data**

(a) data commands

(b) dir command

(c) disk command

(d) formed Commands

**32. While working with MS-DOS which command transfers specific file from one Disk to another ?**

(a) copy (b) disk copy

(c) time (d) rename

**33. if you don’t know the current time. Which command will you used display**

(a) copy (b) ver.

(c) time (d) format

**34. Which command divides the surface of the blank disk into sectors and assign a unique address to each one ?**

(a)Ver (b) formed

(c) fat (d) chkdsk

**35. Each time turn on your computer, it will check on the control file**

(a) Command.com. Io .sys

(b) command.com. date.com dir.com

(c) Command.com.io.sys, msdos.sys

(d) chkdsk.exe

**36. if you need to duplicate the eateries disk, which command will you use**

(a) copy (b) Disk copy

(c) Chkdsk (d) format

**37. Which of the following extension suggest that the file is backup copy?**

(a) Back (b) bas (c) com (d) txt

**38. Which command lists the contents of current directory of a disk?**

(a) Copy (b) tree (c) cd (d) dir

**39. Only filenames and extension are to be displayed in wide format, which Command, you use?**

(a) Dir/w (b) Dir a (c) Dir /s (d) dir /b

**40. Which command display all the file having the same name but different Extension**

(a) dir filename (b) dir filename.etc (c) die\*sys (d) dir \*.etc

**41. Which command displays only file and directory names without size while lis Listing**

(a) Dir/w (b) Dir/a

(c) Dir/b (d) Dir/s

**42. Which command display comma thousand separating on file size while listing**

(a) Dir/w (b) Dir/s

(c) Dir/b (d) Dir/c

**43. Which command is used to display all the files having the (.exe) extension. But different filename?**

(a) Dir filename (b) Dir filename

(c) dir\*sys (d) Dir\*ext

**44. Which command should be used to display all file within the specified Subordinate directory of the subdirectory?**

(a) Dir/pathname

(b) Dir/ pathname / pathname

(c) Dir /ch

(d) Dir pathname\file name

**45. Which command display the directory list including file in tree structure?**

(a) Dir/s/f (b) Tree/f

(c) tree/s/f (d) Dir/f

**46. which command will be used to a file within the specified directory of Pathname?**

(a) Dir / Pathname

(b) Dir / Pathname/ Pathname

(c) Dir/ch

(d) Dir / Pssathname/filename

**47. Which command creates a directory or subdirectory?**

(a) Dir (b) Mkdir

(c) MD (d) both ‘b’ and ‘c,

**48. Which command is used to delete the directory that is empty?**

(a) dir (b) CD

(c) Mk dir (d) both ‘a’ and ‘b’

**49. which command is used to delete the directory that is empty?**

(a) Del (b) RD

(c) erase (d) MD

**50. an entire pathname, consisting of several sub-directory names can contain**

**Uton**

(a) 13charecter (b) 36 character

(c) 63charecter (d) 53 character

**51. it is a set of programs, which controls, coordinates and supervise the Components of computer system**

(a) operating system

(b) processing system

(c) network system

(d) System software

**52. Which one of these is an operating system?**

(a) MS office (b) MS-DOS

(C) MS word (d) MS access

**53. it is only OS, which can be loaded in the main memory of the computer**

(a) MS-word (b) MS access

(c) MS DOS (d) MS Access

**54. it allows only one user to work on a CPU at a time**

(a) single user operating system

(b) multi user Operating system

(c) multi level operating system

(d) two level operating system

**55. which command is used to delete the directory that is empty?**

(a) Del (b) RD (c) erase (d) MD

**56. It is a step by step process that undergoes many step to load the files.**

(a) Loading (b) accessing

(c) Booting (d) starting

**57. It is a collection of logically related information.**

(a) Folder (b) information

(c) Processing (d) File

**58. These DOS command are loaded in primary memory of the computer**

(a) Internal (b) External

(c) Both ‘a’ and ‘b’ (d) None of these

**59. It is used when more than one file is to be used form one directory.**

(a) Will cards (b) Wild Cards

(c) Wind card (d) Wilt cards

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | A | 2 | D | 3 | A | 4 | D | 5 | c |
| 6 | A, | 7 | B | 8 | A | 9 | A | 10 | c |
| 11 | D | 12 | C | 13 | D | 14 | B | 15 | d |
| 16 | C | 17 | B | 18 | D | 19 | D | 20 | b |
| 21 | C | 22 | C | 23 | C | 24 | D | 25 | b |
| 26 | A | 27 | C | 28 | C | 29 | C | 30 | d |
| 31 | A | 32 | A | 33 | C | 34 | D | 35 | c |
| 36 | B | 37 | A | 38 | D | 39 | A | 40 | a |
| 41 | C | 42 | D | 43 | D | 44 | B | 45 | b |
| 46 | D | 47 | D | 48 | D | 49 | B | 50 | c |
| 51 | A | 52 | 53 | C | 54 | A | 55 | B | 56 |
| C | 57 | D | 58 | A | 59 | B |  |  |  |

**DATA DETERMINATION**

**1. Data representation in a computer uses the number system.**

(a) Decimal (b) Number

(c) Binary (d) integers

**2. The basic architecture of computer was developed by**

(a) John Von Neumann

(b) Charies Babbage

(c) Blaise Pascal

(d) Gorden Moore

**3. 1 megabyte (MB) equal to**

(a) 220 bites (b) 1 kilo KB

(c) Both ‘a’ and ‘b’ (d) 1024 bytes

**4. 1 kilobyte (KB) equal to**

(a) 1000 bits (b) 1001

(c) 1024 bits (d) 1030 bits

**5. The result of the subtraction (1011)2 –(0010)2  is**

(a) 0001 (b) 1001 (c) 1011 (d) 1111

**6. The binary equivalent of decimal number 98 is**

(a) 1100011 (b) 1110100

(c) 000100 (d) 100100

**7. The product of two binary number (1011) and (1001) is**

(a) 1100011 (b) 1010100

(c) 000100 (d) 100100

**8. A byte represents a group of**

(a) 10 bits (b) 40 bits

(c) 8 bits (d) 22 bits

**9. A (n) hex digit can be represented by**

(a) Three binary (consecutive) bits

(b) four binary (consecutive) bits

(c) eight binary (consecutive) bits

(d) None of the above

**10. When a key is pressed on the keyboard, which standard is used converting the keystroke into the corresponding bits?**

(a) ANSI (b) ASCII

(c) EBCDIC (d) ISO

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | C | 2 | A | 3 | C | 4 | B | 5 | B |
| 6 | C | 7 | A | 8 | C | 9 | B | 10 | A |

**PROGRAMING LANGUAGE**

**1. CPU can directly understand this language**

(a) C (b) C++

(c) Assembly (d) Java

**2. Which language is CPU dependent**

(a) C (b) Assembly

(c) Java (d) All except Java

**3. Languages which can easily interact with the hardware are called.**

**4. How many bits are there is ASCI codes**

(a) 8 (b) 10 (c) 12 (d) 16

**5. Machine language……………**

(a) is the language is which programs were first written

(b) is the only6 language understood by the computer

(c) different form one type of computer to another.

(d) All of the above

**6. Assembly language….**

(a) uses alphabetic codes in place of binary numbers used in machine language

(b) is the easiest language to write programs

(c) need not be translated into machine language

(d) None of the above

**7. A computer language which is use for drawing pictures on the screen is**

(a) LOGO (b) COBOL

(c) BASIC (d) ALGOL

**8. Computer language used on Internet is**

(a) PASCAL (b) JAVA

(c) BASIC (d) LOGO

**9. A computer program used for business applications is**

(a) LOGO (b) COBOL

(c) BASIC (d) FORTRAN

**10. Computer understands only one language and that is**

(a) source language

(b) machine language

(c) high level language

(d) low level language

**11. Computer language used for scientific calculation etc.**

(a) LOGO (b) FORTRAN

(c) BASIC (d) C++

**12. The language use for development of various games is**

(a) C (b) C++ (c) java (d) SQL

**13. C++ allows you to develop for windows and**

(a) DOS (b) internet

(c) Both ‘a’ and ‘b’ (d) None of these

**14. Visual Basic is a development tool.**

(a) Yes (b) No

(c) Not confirmed (d) None of these

**15. Which of the following is not true of FORTRAN?**

(a) it was developed for scientific and mathematical applications

(b) it is one of the oldest high-level languages

(c) it is a problem oriented language

(d) it requires extensive internal documentation

**16. All of the following are divisions of the COBOL program except**

(a) input-output (b) identification

(c) procedure (d) data

**17. In a COBOL program, the input-output section is within the…………division**

(a) identification (b) procedure

(c) configuration (d) environment

**18. which of the following is not characteristic of COBOL**

(a) it is a very standardized language

(b) it is a very efficient in terms of coding and execution

(c) it has limited facilities for mathematical notation

(d) it is very readable language

**19. Which of the following is an example of problem oriented language?**

(a) BASIC (b) PL/1

(c) FORTRAN (d) All of these

**20. in the evaluation of a computer language, all of the following characteristics should be considered except?**

(a) Application oriented features

(b) Efficiency

(c) Readability

(d) Hardware maintenance cost

**21. a factor in the selection of a source language is**

(a) programmer skill

(b) language availability

(c) program compatibility with other software

(d) All of these

**22. A computer generated output that lets programmer follow the execution of their programs line by line is a**

(a) core dump (b) trace routine

(c) detail listing (d) source listing

**23. in BASIC, description comments are put n the source program with the.**

(a) PRINT statement

(b) REMARK statement

(c) input statement

(d) DATA statement

**24. which of the following generations of language will likely include the languages of the feature?**

(a) First generation

(b) Second generation or third generation (c) Fourth generation

(d) Fifth generation

**25. Electronic spreadsheets are most useful in a situation where relevantly …………..data must be input but …………calculations are required.**

(a) little: simple (b) large; simple

(c) large; complex (d) little; complex

**26. The two basic types of record access methods are**

(a) sequential and rendon

(b) direct and immediate

(c) Sequential and indexed

(d) on-line and real-time

**27. Which file organization is allowed by a direct access storage device?**

(a) Direct only

(b) Sequential and direct only

(c) Indexed and direct only

(d) Sequential, indexed and direct

**28. Sequential file organization is most appropriate for which of following application?**

(a) Grocery store checkout

(b) Bank checking account

(c) payroll

(d) Airline reservation

**29. Which of the following file organization is most efficient for a file with a high degree of file activity?**

(a) Sequential (b) ISAM

(c) VSAM (d) B-Tree

**30. One disadvantage of a direct access file is**

(a) The delay in computing the storage address

(b) duplication of address locations

(c) unused, but available, storage locations

(d) All of these

**31. All computers execute**

(a) BASIC programs

(b) COBOL programs

(c) Machine language program

(d) FORTRAN programs

**32. Which of the following is most oriented to scientific programming?**

(a) FORTRAN (b) COBOL

(c) BASIC (d) pl/1

**33. All of the following are disadvantage of RPG except.**

(a) it is a very dependent on machine language

(b) it is very limited in scope

(c) is not suited for complex problem requiring extensive programming logic.

(d) it has large storage requirements.

**34. Which of the following is not one of the processes that a high-level language program must go though before it is ready to be executed?**

(a) Translation (b) Controlling

(c) Lading (d) Linking

**Answers**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | C | 2 | D | 3 | B | 4 | A | 5 | D |
| 6 | A | 7 | A | 8 | B | 9 | B | 10 | B |
| 11 | B | 12 | B | 13 | C | 14 | A | 15 | B |
| 16 | A | 17 | D | 18 | B | 19 | D | 20 | D |
| 21 | D | 22 | B | 23 | B | 24 | C | 25 | D |
| 26 | A | 27 | D | 28 | C | 29 | A | 30 | A |
| 31 | C | 32 | A | 33 | B | 34 | A |  |  |

**MICROSOFT WORD**

**1. The shortcut key used for copying selected text into clipboard is**

(a) Ctrl+X (b) Ctrl+V

(c) Ctrl+C (d) Ctrl+D

**2. The shortcut key used for pasting text from clipboard is.**

(a) Ctrl + X (b) Ctrl + B

(c) Ctrl + C (d) Ctrl + D

**3. To open a new file in MS-Word, the shortcut key is**

(a) Ctrl + X (b) Ctrl + N

(c) Ctrl + Y (d) Ctrl + V

**4. Which extension is given to Word document by default?**

(a) .EXT (b) .COM

(c) .DOC (d) None of these

**5. Mark the most appropriate option statements.**

(a) Mail Merge can be used to print the form letters

(b) Main Merge Can be used to print the form letters and mailing labels

(c) Main Merge Can be used to print envelopes

(d) All of the above

**6. What is the term used for the word processing programs that show you directly on the PC screen the appearance of your final document as you might expect on the paper?**

(a) Search & Replace (b) Pagination

(c) Soft Copy (d) WYSIWYG

**7. Creating form letters using Main Merge involves**

(a) Creating the main document

(b) Creating the main document and data source

(c) Inserting merges fields in the main document and merging the man document with data source.

(d) Both ‘b’ and ‘c’

**8. Which of the following gives the statues of your document like page number, number of pages?**

(a) Status bar

(b) Standard toolbar

(c) Formatting toolbar

(d) none of these

**9. Alignment buttons are available on which toolbar?**

(a) status (b) Standard

(c) Formatting (d) None of these

**10. Header is**

(a) Any text printed at the top of every page.

(b) Any graphics printed at the top of every page

(c) Any text or graphics printed at the top of a particular page.

(d) Any text or graphics printed at the top of every page.

**11. This case converts first character of first word of selected sentence to capital.**

(a) sentence (b) upper

(c) toggle (d) title

**12. Which of the following is not an option of edit menu?**

(a) Cut (b) Copy

(c) Paste (d) Page setup

**13. Which of the following will you option for saving a file?**

(a) Save button on Standard toolbar

(b) Save option from File menu

(c) Pressing Ctrl + S

(d) All of these

**14. By default the top margin in the word document is.**

(a) 1 inch (b) 2 inch

(c) 3 inch (d) 1

**15. By default the bottom margin in the word document is.**

(a) 2 inch (b) 1 inch

(c) 3 inch (d) 1

**16. By default the right margin in the word document is.**

(a) 1 inch (b) 2 inch

(c) 3 inch (d) 1

**17. By default the left margin in the word document is.**

(a) 1 inch (b) 2 inch

(c) 3 inch (d) 1.25

**18. A file name cannot contain in MS-Word database file**

(a) a letter (b) number

(c) underscore (d) space.

**19. There may be maximum of how many characters in a data file.**

(a) 20 (b) 30 (c) 40 (d) 50

**20. When you start MS-Word, the opening document has the name as**

(a) DOC 1 (b) Document 1

(c) Document (d) None of these

**21. Selection of text involves only.**

(a) single word

(b) line or multiple lines

(c) paragraph or paragraphs and complete document.

(d) All of the above.

**22. The following is the shortcut key for spelling check.**

(a) F1 (b) F3 (c) F5 (d) F7

**23. The following shortcut keys are used for selecting the whole document.**

(a) Ctrl + A (b) Ctrl + S

(c) Ctrl + W (d) Ctrl + X

**24. ‘Replace’ option is available in**

(a) Edit menu (b) File menu

(c) Tools menu (d) insert menu

**25. After selecting the ‘Replace’ option for the Edit menu, the following dialog box appears**

(a) Replace (b) Find

(c) Tools menu (d) insert menu

**26. The field names are enclosed within**

(a) << >> (b) >> <<

(c) >> >> (d) << <<

**27. When you start spelling checker, it stats checking the spellings**

(a) From the end of the document to upward

(b) From the beginning of the document and downward.

(c) From the insertion point

(d) None of the above

**28. MS-Word can insert/import the graphics**

(a) created in paintbrush

(b) created by using auto shapes.

(c) From clipart gallery (d) All of these

**29. You can use the following objects created in MS-Word in a web page.**

(a) auto shapes (b) bullets

(c) tables and charts (d) All of these

**30. When you insert an object/graphic in word document and click on it then**

(a) 8-sizing handle appears around it

(b) 6-sizing handle appears around it

(c) 10-sizing handle appears around it

(d) 12-sizing handle appears around it

**31. In word processing, you manipulate**

(a) numbers (b) next

(c) symbols (d) None of these

**32. you can set left, right and ……… alignment in word processing.**

(a) centre (b) justify

(c) Both ‘a’ and ‘b’ (d) None of these

**33. Can you spell check your text in word processing.**

(a) Yes (b) No

(c) Both option Y/N (d) Not applicable.

**34. Can you locate a word in word processing?**

(a) No (b) Yes

(c) Both option Y/N (d) Not applicable.

**35. Blinking point which show your position n the text is called**

(a) Cursor (b) Blinker

(c) Position (d) None of these.

**36. Spacebar is used for**

(a) giving space (b) deleting space

(c) moving next line (d) None of these

**37. You can start Microsoft Word b sing which button?**

(a) New (b) Start

(c) Program (d) None of these

**38. For creating a document, you use which command at File menu?**

(a) New (b) Open

(c) Document (d) None of these

**39. For saving a document, you need to have………… for it.**

(a) name (b) surname

(c) folder (d) address

**40. For opening an existing document, your need t given which command?**

(a) New (b) Open

(c) Close (d) None of these

**41. you can select the text by.**

(a) keyboard (b) Mouse

(c) Both ‘a’ and ‘b’ (d) None of these

**42. you click at B to make the text**

(a) bold (b) italics

(c) underline (d) None of these

**43. Can you emboss you text?**

(a) Yes (b) No

(c) Not applicable (d) None of these

**44. you can change the size of the text form**

(a) formatting bar (b) font dialog box

(c) Both ‘a’ and ‘b’ (d) None of these

**46. Word wrap is**

(a) a automatic distance of a line

(b) a step to attach a data

(c) a automatic placement of a word on the next line.

(d) None of these

**47. Color of the text can be changed**

(a) Yes (b) No

(c) Not applicable (d) None of these

**48. You click at U to mark the text**

(a) bold (b) italics

(c) underline (d) None of these

**49. Font is**

(a) Type styles of a character

(b) Type styles of a file

(c) Type styles of a document

(d) None of these

**50. You can change the line and Para spacing from this dialog box.**

(a) Font (b) open

(c) Save (d) None of these

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | C | 2 | B | 3 | B | 4 | C | 5 | D |
| 6 | D | 7 | D | 8 | A | 9 | C | 10 | D |
| 11 | A | 12 | D | 13 | D | 14 | A | 15 | B |
| 16 | D | 17 | D | 18 | D | 19 | C | 20 | B |
| 21 | D | 22 | D | 23 | A | 24 | A | 25 | C |
| 26 | A | 27 | C | 28 | D | 29 | D | 30 | A |
| 31 | B | 32 | C | 33 | A | 34 | B | 35 | A |
| 36 | A | 37 | B | 38 | A | 39 | A | 40 | B |
| 41 | C | 42 | A | 43 | A | 44 | C | 45 | B |
| 46 | C | 47 | A | 48 | C | 49 | A | 50 | D |

**MS-ACCESS**

**1. Modules are**

(a) a selection of commands used to automate repetitive tasks

(b) programs written in visual basic

(c) object tabs

(d) a group of records

**2. APPEND command is use to**

(a) add Record to the start of active database file

(b) add Record to the start of active database file ad starts full screen data entry

(c) add Record to the start end of database file

(d) add Record to the end of active database file and star5ts full screen data entry

**3. Append from command is used to**

(a) add records for a file

(b) add records from a variable

(c) Add record for edit menu

(d) add records from information in an array

**4. Examples of centralized multi-user database are**

(a) airline reservations and other national global booking system,

(c) supermarket stock control, organ donor database, client database

(d) None of the above

**5. New record is added using**

(a) append record from browse menu

(b) append record into from browse menu

(c) append record from edit menu

(d) All of these

**6. When a customer makes an online hotel booking, the database in updated in**

(a) batch mode (b) pseudo real-time

(c) 2 days (d) All of these

**7. What is the name for match between the word or phrases being searched and the items found in an electronic database?**

(a) Bug (b) Hit

(c) It (d) Default

**8. A database that contains tables linked by common fields is called a**

(a) Centralized database

(b) flat file database

(c) Relational database

(d) none of these

**9. DBME is**

(a) collection of data

(b) set of programs to access those data

(c) set of programs to update those data

(d) All of these

**10. COPY STRUCTURE command is used to**

(a) Copy contents of an active database to a new file

(b) copy records of an active database to disk

(c) copy contents of an active database to a disk

(d) coy structure of an active database to a new file

**11. COUNT commad is used to**

(a) count the number of data fields in an active database file

(b) count the number of data fields which are active

(c) Count the records which are updated

(d) Count the number of records in an active database file

**12. What is the term to ask the computer to put information in order numerically or alphabetical?**

(a) Crop (b) Report

(c) Sort (d) Organize

**13. The raw facts are called**

(a) Database (b) programs

(c) commands (d) responses

**14. What term refers to a collection of related information?**

(a) Database (b) List

(c) Outline (d) Record

**15. A from that is used to collect data in a structured manner for entry to a database is called a**

(a) database design form

(b) systems flowchart

(c) data capture form

(d) None of these

**16. The use of integrated collections of database records and files for data storage and processing selection the best fit for answer**

(a) Database management approach

(b) DBMS uses

(c) Database administrator

(d) Query language

**17. Which is the short key to invoke the spell checker in MS Access?**

(a) F2 (b) F7

(c) Alt + F7 (d) F3

**18. A specialist in charge of the database of an organization. Select the best fit for answer.**

(a) Database management approach

(b) DBMS uses

(c) Database administrator

(d) Query language

**20. It presents data in a way similar to an excel spreadsheet.**

(a) Datasheet view (b) Design view

(c) Print preview (d) Layout preview

**21. It is used to build and modify database objects and also to create new queries.**

(a) Datasheet view (b) Design view

(c) Print preview (d) Layout preview

**22. It shows the appearance and layout of a report, table or forma in order to confirm what will be printed.**

(a) Datasheet view (b) Design view

(c) Print preview (d) Layout preview

**23. It examines a small portion or sample of your data in a report before printing it.**

(a) Datasheet view (b) Design view

(c) Print preview (d) Layout preview

**24. Which of the following is not a relational database?**

(a) dBase IV (b) 4th Dimension

(c) FoxPro (d) Reflex

**25. Records are deleted using**

(a) DELETE command followed by pack

(b) DELETE command without pack

(c) DELETE command followed by zap

(d) DELETE command without zap

**26. You can enter data in a data in a table in**

(a) design view (b) datasheet view

(c) format view (d) Both ‘a’ and ‘c’

**27. Creating a data file means**

(a) designing base and defining the structure of the database

(b) getting the information about database

(c) selecting data form database

(d) deleting data from database

**28. In a large DBMS**

(a) each user can “see” only a small part of the entire database

(b) each user can access every subschema

(c) each subschema contains every field in the logical schema

(d) All of the above

**29. A number of computer systems are in operation at a large health and fitness gym. Identify which one comes under the terms of the Data Protection Act, 1998?**

(a) Equipment database, event calendar, directory advice database

(b) restaurant bookings, payroll, sales purchase ledgers

(c) Personnel database, client records

(d) None of the above

**30. You want to keep track of addresses, phone numbers, parent/guardian names as well as class attendance, average and grades. Every so often your want to send reports home that select failing grades and excessive absences. Which part of the Microsoft office suit used in this course is best suited for this kind of information?**

(a) Excel (b) PowerPoint

(c) Access (d) Word

**31. Each individual data items of record is called a**

(a) field (b) data type

(c) comment (d) All of these

**32. Large collections of files are called**

(a) fields (b) records

(c) databases (d) file system

**33. What term applies to a collection of related rescores in a database?**

(a) File (b) Layout

(c) Comment (d) Field

**34. This set of related data items is known as a**

(a) file (b) report

(c) table (d) None of theses

**35. The framework for storing records in database is.**

(a) from (b) report

(c) query (d) table

**36. Which command is used to search the record that satisfies the specified criteria.**

(a) FOUND (b) SERCH

(c) GET (d) LOCATE

**37. The data in a record is of the following types**

(a) four text fields and tree numeric fields

(b) two integer fields and five text fields

(c) three text fields and four numeric fields

(d) None of these

**38. A treelike structure of records in a database. Select the best fit for answer.**

(a) Hierarchical Database structure

(b) relational database structure

(c) Multidimensional database structure

(d) Sequential database access

**39. What is the language used by most of the DBMSs for helping their users to access data?**

(a) High level language

(b) Query language

(c) SQL (d) 4GL

**40. What is a largest collection of data strode in a compute? You might use this type of program to keep a record of all the friends in your address book.**

(a) Information processing

(b) Spreadsheet

(c) Operating system

(d) Database

**41. Which command is used for inserting records?**

(a) INSERT (b) ADD

(c) Both ‘a’ and ‘b’ (d) None of these

**42. Query is a statement requesting for**

(a) insertion of information

(b) deletion of information

(c) update of information

(d) retrieval of information.

**43. The activity of a file**

(a) is a low percentage of number of records added of deleted form a file

(b) if high, reduces processing efficiency for sequential and non-sequential files

(c) is a measure of the percentage of existing records updated during a run

(d) refers to how closely the files fit into the allocated

**44. Which statement is not valid about indexing?**

(a) It stores the index fields

(b) it stores the corresponding record number

(c) it maintains the alphabetically order

(d) it duplicates the database file

**45. Device that could be used to input data into a database are**

(a) keyboard, fax roller ball

(b) mouse, keyboard, monitor

(c) mouse, keyboard, touch screen

(d) None of these

**46. Which command is used for sorting?**

(a) List (b) Browse

(c) index (d) sort

**47. List command is used to get**

(a) list of database contents

(b) list of user’s contents

(c) list of variables used in database file

(d) None of these

**48. A field that uniquely identifies a record is called a**

(a) main field (b) header

(c) key field (d) None of these

**49. Corrupted index file is corrected using**

(a) modify index (b) recreate index

(c) Update index (d) reined

**50. The navigation buttons enable you to**

(a) move from record to record in a table or form

(b) move form page to page in report

(c) move form object in a database window

(d) Both ‘a’ and ‘d’

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | A | 2 | D | 3 | D | 4 | A | 5 | A |
| 6 | B | 7 | B | 8 | C | 9 | D | 10 | D |
| 11 | D | 12 | C | 13 | A | 14 | A | 15 | C |
| 16 | D | 17 | B | 18 | B | 19 | C | 20 | A |
| 21 | C | 22 | B | 23 | C | 24 | A | 25 | A |
| 26 | C | 27 | A | 28 | A | 29 | C | 30 | C |
| 31 | B | 32 | B | 33 | A | 34 | B | 35 | C |
| 37 | B | 38 | A | 39 | A | 40 | D | 41 | A |
| 42 | D | 43 | A | 44 | D | 45 | C | 46 | C |
| 47 | A | 48 | C | 49 | D | 50 | D |  |  |

**APPLICATION PACKAGES**

**1. An application is**

(a) word processing, accounting and engineering programs are examples of application programs.

(b) Computer program designed to enable users to perform specific job functions.

(c) Goth ‘a’ and ‘b’

(d) None of the above

**2. ……………….computer application are those which involve some other media, together with ordinary text and images and computer capabilities. Common other media types are audio and video.**

(a) Visual (b) Multimedia

(c) Computer game (d) None of these

**3. The feature to customize your desktop to display information that you can update form the internet is**

(a) main desktop (b) explorer window

(c) E-mail (d) None of these

**4. A multi-purpose window which opens nearly for everything is**

(a) main desktop (b) explorer window

(c) browser (d) error window

**5. Which among them is not an application software.**

(a) MS Word (b) ES Excel

(c) Adobe acrobat (d) turbo C compiler

**6. Factor making windows popular is**

(a) multi tasking

(b) desktop features

(c) user friendly GUI features

(d) being inexpensive.

**7. DTP packages cannot do this**

(a) graphics/picture related utility

(b) internet connectivity

(c) word processing

(d) provide print utility

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | C | 2 | B | 3 | A | 4 | B | 5 | D |
| 6 | C | 7 | B |  |  |  |  |  |  |

**TALLY**

**1. The first step to get started with tally**

(a) open company (b) create company

(b) edit company (d) None of these

**2. This function key is used to modify the features of a company**

(a) F11 (b) F12 (c) F10 (d) F1

**3. if ‘Allow Multi-Currency’ is set to ‘yes’**

(a) in the currency symbol field no symbol can be provided

(b) in name field, base currency cannot be set.

(c) it cannot be modified if it has been used

(d) it can be modified if it has used

**4. From where the details of the items sold are listed**

(a) allow invoicing

(b) without invoicing

(c) novice

(d) bill wise

**5. This field has to be set to ‘yes’ to available for ledger accounts.**

(a) allow invoicing

(b) maintain bill wise details

(c) configure

(d) enter purchase

**6. to alter the details of a company**

(a) Tally>F1: details>Alter

(b) Tally>F2:Cmp Info>Alter

(c) Tally>F3: Cmp Info>Alter

(d) Tally>F4: Cmp Info>Alter

**7. This function key is used to set the various applications available in Tally**

(a) F12 (b) F11 (c) F10 (d) F9

**8. It is an exchange of goods for a fixed market price of a perceived value**

(a) trading (b) wholesalers

(c) retailers (d) manufacturer

**9. It purchases merchandise in but from manufactures and sell to retailers.**

(a) trading (b) wholesalers

(c) retailers (d) manufacturer

**10. It purchase merchandise from wholesalers and sell them to the end consumers**

(a) trading (b) wholesalers

(c) retailers (d) manufacturer

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | B | 2 | A | 3 | C | 4 | A | 5 | B |
| 6 | C | 7 | A | 8 | A | 9 | B | 10 | C |

**INTERNET AND NETWORKING**

**1. Your company has a large internal network that you would like to subnet into smaller parts. Which of the following devices can you use to separate your LAN and still protect critical resources? (Select all that apply)**

(a) An internal firewall

(b) A router between subnets

(c) A modem between computers

(d) A switch between departments

**2. Which of the following are considered to be possible components of an Ethernet LAN? (Select all that apply)**

(a) Access Point (AP) (b) Coax

(c) Fiber (d) STP

**3. Which of the following devise is specially designed to forward packets to specific ports based on the packet’s address?**

(a) Specialty hub (b) Switching hub

(c) port hub (d) Filtering hub

**4. Your company receives internet access through a network or getaway server. Which of the following devices are bats suited to protect resources and subnet your LAN directly on the network server?**

(a) DSL modern

(b) A multi-homed firewall

(c) VLAN

(d) A router that acts both as a bridge and rout.

**5. What are some of the benefits of using a firewall for your LAN? (Select all that apply)**

(a) Increased access to in stat messaging

(b) Stricter access control to critical resources

(c) Follows a set of rules

(d) Can be configured to drop packets

**6. Which of the following are true about firewall? (Select all that apply)**

(a) Filters network traffic

(b) Can be either a hardware or software device

(c) Flows a set of rules

(d) Can be configured to drop packets

**7. Which of the following are true about firewall protection when using static packet filtering on the router?**

(a) Static packet filtering is less secure than tasteful filtering.

(b) Static packet filtering is less secure than filtering.

(c) Static packet filtering is more secure than dynamic packet filtering.

(d) Static packet filtering is less secure than tasteful filtering.

**8. A packet filtering firewall operates at which of the following OSI layers? (Select all that apply)**

(a) At the application layer

(b) At the transport layer

(c) At the network (d) At the gateway layer

**9. Firewalls are designed to perform all the following except.**

(a) limiting security exposures

(b) logging Internet activity

(c) enforcing the organization’s security policy

(d) protecting against viruses.

**10. Tasteful firewalls may filter connection-oriented packets that are potential intrusions to the LAN. Which of the following types of packets can a tasteful packet filter deny?**

(a) UDP (b) TCP (c) IP (d) ICMP

**11. Which of the following systems run an application layer firewall using Proxy software?**

(a) Proxy NAT (b) Proxy client

(c) Client 32 (d) Proxy server

**12. Which of the following use routers with packet filtering rules to allow or deny access based on source address, destination address, or port number?**

(a) Application layer firewall

(b) Packet filtering firewall

(c) Router enhanced firewall

(d) IP enabled firewall

**13. Which of the following firewalls keeps track of the connection state?**

(a) Application layer3firewall

(b) Packet filtering firewall

(c) Router enhanced firewall

(d) Status packet filtering firewall

**14. Which of following devices discriminates between multicast and uncast packets?**

(a) Multicast switch (b) Bicast switch

(c) Bicast router (d) Multicast router

**15. Your primary concern is LAN security. You want subnet your internal network with a device that provides security and stability. Which of the following devices do your choose to meet these needs?**

(a) Static router (b) Dynamic router

(c) Static switch (d) Dynamic switch

**16. Which of the following will help you to improve you LAN security? (Select all that apply)**

(a) Change user passwords frequently

(b) Install a firewall program

(c) Use a dynamic rather than static router

(d) Use a proxy

**17. Which of the following will help you to improve your LAN security? (Select all that apply**

(a) Static router

(b) IP enabled router

(c) Dynamic router

(d) RIP enabled router

**18. Which of the following statement are true about routers and bridges? (Select all that apply)**

(a) Bridges connect two networks at the Data Link Layer

(b) Bridges are types of inexpensive router

(c) Routers are improved bridges

(c) Routers connect tow networks at the Network Layer

**19. Remember, routers work at the Network Layer of the international Standards Organization/Open Systems Interconnection (ISO/OS) established sequence of OSI Layers. What is the correct and completes OSI sequence in order form user interface (Layer 7) to the delivery of binary bits (Layer 1)?**

(a) Physical Layer, Network Layer, Data Link Layer, Transport Layer, session layer, presentation layer, application layer

(b) Application layer, presentation layer, session layer, transport layer, Network layer Data link layer, presentation layer

(c) application layer, physical layer, session layer, transport layer, network layer, data link layer, presentation layer,

(d) physical layer, data link layer, network layer, session layer, Transport layer, presentation layer, application layer.

**20. most networks employ devices for routing services. Routers work at which of the following OSI layers?**

(a) Transport (b) Network

(c) Presentation (d) session

**21. You manage a company network and the network budget. You want to minimize costs, but desired to prevent crackers for sniffing your local area network (LAN). Which of the following devices would you recommend to meet your goals?**

(a) Switches use SSH to manage interfaces by defult

(b) Switches use Telnet or HTTP to manage interfaces.

(c) Switches are more secure than routers since they are internal to the LAN

(d) Switches should be placed behind a dedicated firewall.

**23. If you receive an e-mail from someone you don’t know, what should you do?**

(a) Forward it to the police immediately.

(b) Delete it without opening if

(c) open it and respond to them saying your don’t know them

(d) None of the above

**24. Which of the following is actually considered a critical wireless device?**

(a) AP (b) WAP

(c) WEP (d) WLAN

**25. Which of the following true statements about modems? (select all that apply)**

(a) Modems use the telephone lines

(b) Modem stands for modulator and demodulator

(c) Modes are no longer used in secure network

(d) A modem’s fastest transfer rate is 56 kbps

**26. Modes can be configured to automatically answer any incoming call. Many user computers have modems installed form the manufacturer. What is the greatest security risk when dealing with modems in this situation?**

(a) Remote access without network administrator knowledge

(b) Local access without network administrator knowledge.

(c) Client access without network administrator knowledge

(d) Server access without network administrator knowledge

**27. Which of the following terms defines RAS?**

(a) Random Access Security

(b) Remote Access Security

(c) Random Access Service

(d) Remote Access Service

**28. usually, a RAS connection is a dial-up connection. What network connections also apply to RAS? (select all that apply).**

(a) Client-server (b) ISDN

(c) VPN (d) DSL

**29. Your company has gone through several phone company changes to reduce costs. Last week, two new phone company employs indicated that they needed remote access to your company network and wanted to establish a permanent guest account on your RAS server for continued maintenance support. Which of the following actions are your best recommendations for this situation? (Select all that apply)**

(a) Agree with their requests so that maintenance costs are reduced

(b) Recommend that user accounts be verified with strong authentication

(c) Remove the gusts account and cerate verifiable remote accounts

(d) Create a phone company group account and place that inside the guest account

**30. Which of the following applies to PBX? (Select all that apply)**

(a) PBX stands for private Branch Exchange

(b) PBX ALLOWS FOR ANNALOG, DIGITAL,AND data to transfer over a high-speed phone system

(c) PBX stands for Public Broadcasting Exchange

(d) PBX is used to carry as analog messages and modem communication originating at the phone company

**31. your want to have a private communication between two sites that also allows for encryption and authorization. Which of the following is the best choice in this instance?**

(a) Modem (b) Firewall

(c) VPN (d) Bastion Host

**32. VPN tunnels have end points. Which of the following methods is used to offer strong Authentication at each end points?**

(a) DES (b) Block cipher

(c) Stream cipher (d) Diffie-Hellman

**33. VPNs transfer encrypted data through tunneling technology. Which of the following performs fast data encryption and may be used with VPNs?**

(a) Stream Cipher (b) RSA

(c) DES (d) IPSec

**34. you desire to secure a VPN connection. Which protocols should you use? (select all that apply)**

(a) TLS (b) IPSec (c) SSL (d) L2TP

**35. What does the acronym IDS stand for?**

(a) Intrusion Detection System

(b) Internet Detection standard

(c) Internet detection System

(d) Intrusion Detection standard

**36. Which of the following devices is used to monitor network traffic, including DoS attacks in real time?**

(a) A host-based Intrusion DetectionSystem56 internet and Networking

(b) A network-based Intrusion Detection System

(c) A route-based intrusion Detection System

(d) A server-based intrusion Detection System

**37. Which of the following security devices acts more like a detective rather than a preventative measure?**

(a) IDS (b) DMZ (c) NAT (d) Proxy

**38. Which of following protocols is used to monitor network devices such as hubs, switches, and**

(a) IDS (b) SNMP

(c) RIP (d) OSPF

**39. You have been using a network monitor or protocol analyzer to monitor Ethernet packets. One the of the messages sent has an IP header protocol field value of “1”. What does this value classify?**

(a) UDP (b) ICMP (c) IGMP (d) TCP

**40. You have been using a network monitor or protocol analyzer to monitor Ethernet packets. One the of the messages sent has an IP header protocol field value of “6”. What does this value classify?**

(a) UDP (b) ICMP (c) IGMP (d) TCP

**41. Which of the following LAN devices is frequently a source of security concern because of its ability to process applications, share files and perform network services in a peer-to-peer network?**

(a) SQL server (b) Routers

(c) Switches (d) Workstations

**42. You want to prevent users form downloading software on company workstation. What is this called?**

(a) Desktop lookup (b) Desktop lockup

(c) Desktop lockdown

(d) Desktop lookdown

**43. Which of the following is a group independent servers that are goroup0ed together to appear like one**

(a) Proxy server (b) SQL server

(c) Server array (d) Server cluster

**44. Which of the following devices have similar security concerns because they provide file sharing., network connection, and application services? (Select all that apply)**

(a) Switches (b) Server

(c) Mobile device (d) Servers

**45. Many mobile devices us e wireless technology and may lack security. Which of the following devices are considered mobile devices used to connect to a network? (Select all the apply)**

(a) PDR (b) PDA (c) Pager (d) PPP

**46. Which one of the following is small network device that is a security concern for network administrators because the device is easily misplaced?**

(a) Workstation (b) Server

(c) Mobile device (d) VPN

**47. Which of the following are types of network cabling? (Select all that apply)**

(a) Twisted pair (b) Token ring

(c) Fiber optic (d) Coaxial

**48. Which of the following situations would a crossover cable be effective?**

(a) Between a mode and a computer

(b) Between a hub and a computer

(c) Between two computer

(d) Between a switch and router

**49. What does CSMA represent?**

(a) Carrier sensing Minimal Access

(b) Carrier sensing Multiple Access

(c) Carrier sense Minimal Access

(d) Carrier sense Multiple Access

**50. Which of the following is a type of coax cabling transmission method? (select all that apply)**

(a) Baseband (b) Broadband

(c) CSMA/CD (d) CSMA/CA

**51. Some digital computer are called decimal computer because**

(a) Decimal number cannot be read in such computer

(b) Decimal number can be read in such computer

(c) It does not contain decimal numbers

(d) None of the above

**52. Computer program which is used to run the web sites**

(a) Mozilla (b) MS-WORD

(c) FOXPRO (d) UNIX

**53. Among, which is not a web-browser**

(a) Internet Explorer

(b) Mozilla

(c) NetScape Navigator

(d) FOXPRO

**54. Video-conferencing is used for**

(a) taking each other

(b) communicating purpose

(c) live conversation

(d) None of the above

**55. Taking on net with the help of typed text**

(a) chatting (b) E-mail

(c) new group (d) None of these

**56. URL stands for**

(a) Uniform Read Locator

(b) Uniform Resource Locator

(c) Uniform Resource Location

(d) United Resource Locator

**57. Which among of them is a search engine?**

(a) Internet Explorer (b) Flash

(c) Google (d) Fire Fox

**58. PROTOCOL consists of**

(a) TCD/IT (b) TCP/IP

(c) TCP/IT (d) TCT/IP

**59. Which is NOT the feature of Internet**

(a) E-mail (b) New Group

(c) Chat (d) Designing

**60. Some, set rules and regulation while working on Intranet**

(a) Protocol (b) Internet

(c) Intranet (d) WWW

**Answers**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | A  b, d | 2 | b,  c,  d | 3 | b | 4 | B | 5 | B,  c |
| 6 | a,  b,  d | 7 | A,  b | 8 | b,  c | 9 | d | 10 | b,  c |
| 11 | D | 12 | B | 13 | D | 14 | D | 15 | A |
| 16 | A, b,  d | 17 | A | 18 | A,  b | 19 | B | 20 | B |
| 21 | B | 22 | D,  b | 23 | B | 24 | A | 25 | A,  b |
| 26 | A | 27 | D | 28 | B,  c,  d | 29 | B,  c | 30 | A,  b |
| 31 | C | 23 | D | 33 | C | 34 | B,  d | 35 | A |
| 36 | B | 37 | A | 38 | B | 39 | B | 40 | D |
| 41 | D | 42 | C | 43 | D | 44 | C,  d | 45 | B,  c |
| 46 | C | 47 | A,  c,  d | 48 | C | 49 | D | 50 | A,  b |
| 51 | A | 52 | A | 53 | D | 54 | C | 55 | A |
| 56 | B | 57 | C | 58 | B | 59 | D | 60 | A |

**MODEL TEST PAPER 1**

**1. The CPU is made up of two smaller components**

(a) ALU and CU (b) ALU and RAM

(c) RAM and ROM (d) RAM and CU

**2. The binary system uses the symbols**

(a) 0,0 (b) 1.0 (c) 0,1 (d) 1,1

**3. The digits of the binary system are called**

(a) Byte’s (b) Bit’s

(c) Nibble’s (d) Number’s

**4. A unit of eight bit memory cell groups is called a**

(a) bit (b) Nibble

(c) byte (d) digit

**5. A KB in computer technology is equal to**

(a) 1024 bytes (b) 1020 bytes

(c) 1000 bytes (d) 1002 bytes

**6. In which year the first operating system was developed?**

(a) 1910 (b) 1890 (c) 1950 (d) 1980

**7. MS-DOS developed in**

(a) 1991 (b) 1984 (c) 1971 (d) 1961

**8. Maximum length of DOS command using any optional parameter is.**

(a) 26 character (b) 87 characters

(c) 127 characters (d) None of these

**9. In which version of DOS.CHKDSK command has been changed to SCANDISK?**

(a) 5.0 (b) 5.2 (c) 6.0 (d) 6.2

**10. CHKDS command is used to**

(a) Analyze the hard disk error

(b) diagnose the hard disk error

(c) report the statues of files on disk

(d) All of these

**11. Where header appears?**

(a) Top (b) Bottom

(c) Center (d) None of these

**12. Where footer appears?**

(a) Top (b) Bottom

(c) Center (d) None of these

**13. For printing a document you have to put on**

(a) printer (b) monitor

(c) scanner (d) None of these

**14. Most of the editing tools are available under which menu?**

(a) File (b) Format

(c) Edit (d) None of these

**15. You can add picture in your document form the which menu?**

(a) File (b) Format

(c) insert (d) None of these

**16. When you save an access project, what file format do you use?**

(a) .adp (b) .Xm

(c) .mbd (d) All of these

**17. Which of the following criterion would find records whose personality field does not equal ‘Nice’?**

(a) <> Nice (b) Not Nice

(c) <> “Nice” (d) is not Nice

**18. According to the access timeline of Microsoft.com, which version of Microsoft Access first included the North wind Traders sample database?**

(a) 10.

(b) 2.0

(c) 7.0 for Windows 95

(d) All of these

**19. Which version of access first provided ODBC connectively to Oracle database?**

(a) 1.1 (b) 2.0

(c) 97 (d) All of these

**20. What was the largest database size allowed by Access 1.0?**

(a) 128MB (b) 256MB

(c) 512 MB (d) None of these

**21. The intersection of a row and column is called**

(a) data (b) a field

(c) a cell (d) an equation

**22. There are three types of data found in a spreadsheet**

(a) data, words, numbers

(b) equations , data ,number

(c) Words, numbers, labels

(d) numbers, formulas, labels

**23. To select a column the easiest metho9d is to**

(a) double click any cell in the column

(b) drag from the top cell in the column to the last cell in the column

(d) click the column label

**24. The cell accepts your typing as its contents. If you press**

(a) Enter (b) Ctrl + Enter

(c) Tab (d) Insert

**25. Which of the following special function keys allow the content in cell?**

(a) Esc (b) Shift (c) Return (d) Tad

**26. Slide show options available to the presenter include all of the following except**

(a) transitions command

(b) speaker notes command

(c) meeting reminder command

(d) navigation commands

**27. Presentation designs regulate the formatting and layout for the slide and are commonly called**

(a) design plates (b) templates

(c) placeholders (d) blueprints

**28. Which of the following bypasses the print dialog box when printing individual slides or an entire presentation?**

(a) File, print purview (b) Print button

(c) File, print (d) Ctrl + P

**29. To add a header or footer to you handout, you can use the**

(a) title master (b) slide master

(c) handout master (d) All of these

**30. Which of the following will not advance the slides in a slide show vies?**

(a) Esc key (b) Spacebar

(c) Enter key (d) Mouse button

**31. It is not that acknowledges and accounts for an amount by a person or a company**

(a) debit note (b) credit note

(c) sales not (d) purchase not

**32. It is a not that acknowledges and accounts for an amount by a person or company**

(a) debit note (b) credit note

(c) sales not (d) purchase not

**33. It is an indirect tax on goods, introduced in lieu of sales tax, to ensure transparency and greater compliance**

(a) tax (b) income tax

(c) value Added Tax (d) indirect tax

**34. This is a tax paid on purchases**

(a) input tax (b) output tax

(c) input credit (d) output credit

**35. This is a tax charged on sales**

(a) input tax (b) output tax

(c) input credit (d) output credit

**36. Which one of the following is the greatest advantage of coax cabling?**

(a) High security

(b) Physical dimensions

(c) Long distances (d) Easily tapped

**37. Which of the following types of coax cabling has tow outer conductors or shields, and offers greater resistance and decreased attention?**

(a) STP coax

(b) Dual-shielded coax

(c) Multi-shielded coax

(d) Bi-coax

**38. Which of the following can transmit data at speeds of up to 16 Mbps?**

(a) Category 1 UTP (b) Category 2 UTP

(c) Category 3 UTP (d) Category 4 UTP

**39. Which of the following is not a property of twisted-pair cabling?**

(a) Twisted-pair cabling is a relatively low-speed transmission

(b) The wires can be shielded

(c) The wires can be unshielded

(d) Twisted-pair cable carries signals as light waves

**40. What is the media standard for most local network installation?**

(a) Fiber (b) CAT 3

(c) CAT 5 (d) Thinned

**41. The most familiar output device for the micro coputers is the**

(a) screen (b) TV

(c) printer (d) monitor

**42. The four functional components of a digital computer are-input device, output device and**

(a) CPU, CU (b) ALU, memory

(c) CPU, memory (d) ALU,CU

**43. Internal storage is also called main**

(a) memory (b) area (c) screen (d) unit

**44. Collecting the data and converting it into information is called**

(a) compiling (b) processing

(c) importing (d) exporting

**45. Result are obtained from computer through its**

(a) input unit (b) ALU unit

(c) CU unit (d) output unit

**46. Which file is the batch file that is read while booting a computer?**

(a) Aoutexec.bat (b) Auto-batch

(c) Autoexeuitve.bat (d) Auito.bat

**47. Which command is used to backup in DOS 6+ Version?**

(a) BACKUP (b) MSBACKUP

(c) MSBACKEDUP (d) All of these

**48. Copy and Xcopy are same in the sense**

(a) both are internal commands of DOS

(b) both are external commands of DOS

(c) both can be used to copy file or group files

(d) Both ‘a’ and ‘b’

**49. Which command be used to cleared the screen and display the operating system prompt on the first line of the display?**

(a) Cd (b) Md

(c) rename (d) Cls

**50. Intenal command in DOS are**

(a) Cls, rd lable

(b) Dir, ren, sys

(c) Time, type, dir

(d) Del, disk copy, label

**51. Clip Art is**

(a) text (b) graphics

(c) Both ‘a’ and ‘b’ (d) none of these

**52. Can text be mingled with graphics?**

(a) yes (b) no

(c) Both ‘a’ and ‘b’ (d) none of these

**53. Word Art is a**

(a) text

(b) graphic

(c) independent program

(d) None of these

**54. you can set margins by using the dialog box**

(a) font (b) page setup

(c) margins (d) None of these

**55. Two main orientations are portrait and**

(a) landscape (b) photo

(c) lying (d) None of thee

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | A | 2 | C | 3 | B | 4 | C | 5 | A |
| 6 | B | 7 | B | 8 | C | 9 | D | 10 | D |
| 11 | A | 12 | B | 13 | A | 14 | C | 15 | C |
| 16 | A | 17 | C | 18 | A | 19 | A | 20 | A |
| 21 | C | 22 | D | 23 | C | 24 | A | 25 | C |
| 26 | A | 27 | B | 28 | B | 29 | C | 30 | A |
| 31 | A | 32 | B | 33 |  | 34 | A | 35 | B |
| 36 | C | 37 | B | 38 | D | 39 | D | 40 | C |
| 41 | D | 42 | C | 43 | A | 44 | B | 45 | D |
| 46 | A | 47 | B | 48 | C | 49 | D | 50 | C |
| 51 | B | 52 | A | 53 | C | 54 | B | 55 | A |

**MODEL TEST PAPER 2**

**1. Instruction’s to compute are given through**

(a) input unit (b) ALU unit

(c) keyboard (d) pen drive

**2. Calculations are made in computer with the help of its**

(a) memory (b) control unit

(c) ALU (d) CPU

**3. A unit of measure equal to approximately 1 billion bytes is called a**

(a) 1 MB (b) 2 MB (c) 2 GB (d) 1 GB

**4. Which of the following is an example of non-volatile memory?**

(a) ROM (b) RAM (c) LSI (d) VLSI

**5. Which of the following is a unit of measurement used with computer system?**

(a) Byte (b) Megabyte

(c) Gigabyte (d) All of these

**7. To copy the hidden system files of DOS to another disk you can use the command**

(a) Copy (b) Ren

(c) Sys (d) Diskcopy

**8. Disk copy command is DOS is used to**

(a) copy a file

(b) copy contents of one floppy disk to another

(c) copy contents of CD-ROM to another

(d) All of these

**9. The command used to copy a file named temp.doc form drive C: to drive A:is**

(a) Copy temp.doc to a:

(b) copy C:\temp.doc a:

(c) copy c: a:

(d) copy tem a: c:

**10. External command is DOS are**

(a) copy, edit, sys, format

(b) edit, sys, chkdsk

(c) chkdsk, prompt, date (d) sys, ver, vol

**11. can you shade your text?**

(a) yes (b) no

(c) Both ‘a’ and ‘b’ (c) None of these

**12. Is decimal a tab?**

(a) yes (b) no

(c) Both ‘a’ and ‘b’ (c) None of these

**13. In text you can find a word and replace it with another word using command**

(a) find (b) replace

(b) both ‘a’ and ‘b’ (c) None of these

**14. You can save your document using which command?**

(a) Save (b) save as

(c) open (d) Edit

**15. Using this command you can find a word**

(a) edit (b) find

(c) file (d) edit

**16. What is the maximum character field size you can set for a field that has a text data type?**

(a) 512 characters (b) 50 characters

(c) No limit (d) 255 characters

**17. What is the maximum character field size you can set for a field that has a text data type?**

(a) 64 (b) 255

(c) 512 (d) All of these

**18. Which of the following fields would not make a suitable primary key?**

(a) A date field

(b) An invoice number

(c) An auto number field

(d) A customer’s social security number

**19. Auto reports can contain each of the following elements except**

(a) a detail section (b) a page footer

(c) a group header (d) All of these

**20. Need to see all the information from two tables on one form, insert.**

(a) a page break

(b) a sub form

(c) a lined command button

(d) None of these

**21. Which is not an advantage of using computerized spreadsheets?**

(a) Flexibility moving entries

(b) Speed of calculation

(c) Ability of generate tables

(d) Cost of initial setup

**22. To select several cells or ranges that are not touching each other, what would you do while selecting?**

(a) Hold down the Ctrl key

(b) Hold down the Shift key

(c) hold down the Alt key

(d) hold down Ctrl + shift key

**23. What is the Auto Summarize feature used for in Word 2000?**

(a) It creates a 250 words, 500 words or 1000 words summary of the document

(b) it adds automatic head wise, bold and italic characters as well as automatic formatting of the document to give the look of a well summarized document.

(c) it summarizes the statistics of the document into a report such as total words, total characters, total pages, total paragraphs ,file size etc.

(d) It identifies the key points in a document for your to share with others or quickly scan

**24. A certain spreadsheet show in Page Break Preview that cells in rows 1-25 have white background. The cells in row 26 that contain data have a dark grey background, when you click the Print button**

(a) nothing will print because some cells with data have been omitted

(b) only the cells with gray background will print

(c) the whole sheet will print

(d) only the cells with white background will print

**25. A constant is another mane for this type of data**

(a) Number (b) equation

(c) formula (d) description

**26. What are lines, curve, freeform and scribble?**

(a) Emphasis effects that can be applied to animations

(b) Types of custom motion paths

(c) Predefined entrance and exit effects

(d) All of the above

**27. Comments on a presentation can record who wrote them and when they were added. What’s the automatic way in Power Pont 2002?**

(a) Use online collaboration

(b) use comments

(c) use the notes page (d) all of these

**28. When using Power point, to play a Power Point show for previewing the show, select**

(a) view, slide sorter (b) view, slide

(c) view, slide show (d) view, slide show

**29. In Microsoft Power Point in order to see all the slides on one screen use**

(a) view, slide sorter (b) view, slide

(c) view, slide show (d) view, slide show

**30. What’s the best place to find animated images for you Power Point 2002 presentation?**

(a) Microsoft online

(b) Word clipart

(b) Power Point tools and ins

(d) All of these

**31. The amount of input tax that is permitted to be set off against output tax**

(a) input tax (b) output tax

(c) input credit (d) output credit

**32. it is a levy on purchase and sale of good in India**

(a) input tax (b) output tax

(c) input credit (d) sales tax

**33. It is levied under authority of both Central Legislation and state government legislation**

(a) sales tax (b) purchase tax

(c) income Tax (d) tax

**34. The first step to get started with Tally is to create a…………………**

(a) account (b) company

(c) income Tax (d) tax

**35. It is the primary online document for recording transactions**

(a) file (b) entry

(c) voucher (d) receipt

**36. Which of the following is not a property of fiber optic cabling?**

(a) Transmits at faster speeds than copper cabling

(b) Easier to capture a signal form than copper cabling

(c) very resistant to interference

(d) Carries signals as light waves

**37. What does fiber use to transmit data?**

(a) Vibrations (b) Sound

(c) Electrical current (d) Light

**38. Which of the following network cabling would you choose to install around a noisy room where machines were constantly running?**

(a) fiber (b) STP

(c) Coax (d) UTP

**39. you’ve been told about radio frequency eavesdropping and want to protect your network from this threat. Which of the following media types would you choose in this situation?**

(a) UTP (b) UDP (c) Coax (d) Fiber

**40. Which of the following is most resistant to electrical and noise interference?**

(a) STP (d) UDP (c) Coax (d) Fiber

**41. Which of the following statements is false?**

(a) Secondary storage is non-volatile

(b) Primary storage is volatile

(c) When the computer is turned off, data and instructions stored in primary storage are erased

(d) None of the above

**42. What does OCR stands for**

(a) Optical Character Reader

(b) Optical character Reader

(c) Optical character Recognition

(d) Only characters Reader

**43. Dot Matrix is a type of**

(a) Tape (b) Disk

(c) Printer (d) Bus

**44. The secondary storage device can only store data but they cannot perform**

(a) arithmetic operations

(b) fetch operations

(c) logic operation

(d) Either of these

**45. In computer science by information we mean**

(a) any output coming out from computer

(b) processed data put in an intelligent form

(c) a report printed by the computer

(d) plural of data

**46. Which keys can be pressed quit without saving in DOS?**

(a) Ctrl + A (b) Ctrl + B

(c) Ctrl + C (d) Ctrl + D

**47. Which command is used to get the current date only**

(a) date (b) Time

(c) second (d) All of these

**48. Generally, the DATE is entered in the form**

(a) DD-YY-MM (b) YY-DD-MM

(c) MM-YY-DD (d) MM-DD-YY

**49. DEL command is use to**

(a) delete files

(b) delete directory

(c) delete labels

(d) delete contents of file

**50. Which command be use to ask you to confirm that you want to delete the directory?**

(a) Deltree (b) Dltree/f

(c) Del\*.\*/p (d) erease\*.\*

**51. The bar which show your current status is called.**

(a) status (b) standard

(c) format (d) title

**52. You can delete one character using this key**

(a) backspace (b) delete

(c) edit (d) format

**53. You can use this alignment to centralize your text**

(a) right (b) centre

(c) left (d) None of these

**54. Spell check is under which menu**

(a) edit (b) view

(c) tool (d) format

**55. Grammatical errors are show in**

(a) red (b) green (c) blue (d) black

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | A | 2 | C | 3 | D | 4 | A | 5 | D |
| 6 | A | 7 | C | 8 | B | 9 | B | 10 | B |
| 11 | A | 12 | A | 13 | B | 14 | A | 15 | B |
| 16 | D | 17 | B | 18 | A | 19 | C | 20 | B |
| 21 | D | 22 | A | 23 | A | 24 | D | 25 | A |
| 26 | B | 27 | B | 28 | C | 29 | A | 30 | B |
| 31 | C | 32 | A | 33 | A | 34 | B | 35 | C |
| 36 | B | 37 | D | 38 | A | 39 | D | 40 | D |
| 41 | D | 42 | A | 43 | C | 44 | B | 45 | B |
| 46 | C | 47 | A | 48 | A | 49 | A | 50 | C |
| 51 | A | 52 | A | 53 | B | 54 | C | 55 | B |

**MODEL TEST PAPER 3**

**1. Which of the following is a correct definition of volatile memory?**

(a) It does its contents at high temperatures

(b) It is to be kept in air-tight boxes

(c) It loses its contents on failure of power supply

(d) It does not lose its contents on failure of power supply

**2. one thousand bytes represent a**

(a) megabyte (b) gigabyte

(c) kilobyte (d) None of these

**3. Large amounts of cherubs are processed by using**

(a) OCR (b) MICR

(c) OMR (d) All of these

**4. The concentric circles on the floppy disk a re further dived into**

(a) tracks (b) sectors

(c) cylinders (d) None of these

**5. Which of the following storage devices can be used for storing large backup data?**

(a) Floppy disk (b) Hard disk

(c) Magnetic tape (d) None of these

**6. which statement is correct?**

(a) Directories can be kept inside a file

(b) Files cannot be kept inside directory

(c) 1 millisecond =10^3 sec

(d) None of these

**7. CHKDSK can be used to find**

(a) disk’s bad portion (b) occupied space

(c) free space (d) all of these

**8. DIR command is used to**

(a) display a list of files in a directory

(b) display contents of files in directory

(c) display type of files in a sub-directory

(d) all these

**9. To copy the file command. Com from drive c: to drive a**

(a) driver c: copy drive a:\command.com

(b) c:a:copy command.com

(c) copy c:\command.com a:

(d) both ‘b’ and ‘c’

**10. While working with MS-DOS which key is used to get the previous command used?**

(a) F3 (b) F1 (c) F6 (d) F9

**11. all open, close icons are there on the which toolbar?**

(a) Formatting (b) Standard

(c) Drawing (d) Table

**12. You can ether page number form which menu?**

(a) Edit (b) file (c) insert (d) tool

**13. Txt can be styled using**

(a) font (b) size

(c) color (d) clipart

**14. you can start a new document using new command which is under this menu**

(a) new (b) edit

(d) file (d) window

**15. Cut operation places the selected text into an area in the memory called**

(a) clip board (b) buffers

(c) window (d) dialog Box

**16. What is the primary difference between a pivot table report and a cross tab query?**

(a) A pivot table report can contains sums, counts, and averages while a cross tab query cannot

(b) you can’t pivot a cross tab query

(c) a cross tab query lets you group similar items. A pivot table report does not

(d) None of the above

**17. The largest unit of a database is**

(a) a record (b) a field   
(c) a subfield (d) None of these

**18. What’s the best access object for an invoice you’ll mall to customer?**

(a) a report (b) a form

(c) a table (d) All of these

**19. What is a grouped Report?**

(a) a type of report that can be generated by the report wizard

(b) A report that displays data that has been sorted in ascending or descending order

(c) a report that display data grouped gy fields you specify

(d) Non of the above

**20. A (n)…..or command is the basic building block of a macro.**

(a) action (b) expression

(c) function (d) procedure

**21. The view that puts a blue line around each page that would be printed is the**

(a) print preview

(b) normal view

(c) page break preview

(d) split view

**22. Auto calculate will quickly add selected cells if you**

(a) right click on the status bare and select sum

(b) clock the auto calculate button on the toolbar

(c) use the key combination Ctrl + $

(d) double lick the selection

**23. The cell labeled 23:54 the cell labeled F5 refers to**

(a) row F column 5

(b) column f row 5

(c) function available n cells

(d) an equal sign

**24. When you are typing an equation into a cell the first thing that must be entered is**

(a) the first cell referenced

(b) parenthesis

(c) quotation marks

(d) an equal sign

**25. using the AutoSum button will replace in the selected cell**

(a) the sum of values in the cell’s column

(b) nothing until you select a range of cells

(c) the sum of the cell’s row unless you change the range

(d) a formula which will add values in the rang e excel guesses you want to add

**26. What is the easy way to apply varied animations to test on slides?**

(a) Apply effects in the custom animation text pane

(b) Apply an application scheme

(c) Customize bullets with animated clipart

(d) All of the above

**27. Using custom animation effect, how do you text appear on a slide by letter?**

(a) Apply the animation scheme fade one by one

(b) Apply an entrance effect and then set it to by letter in the effect option dialog box

(c) Apply the fly in entrance to the text and then set its speed to very slow

(d) All of the above

**28. To exit the PowerPoint application, you should**

(a) click the application minimize button

(b) Click the document close button

(c) Double click the application control menu icon

(d) Double click the document control menu icon

**29. You can create a new presentation by completing all of the following except**

(a) Clicking the new button on the standard toolbar

(b) Clicking file, new

(c) Clicking file, open

(d) pressing Ctrl +N

**30. You have customized a design template in one presentation and you want to use it in another presentation. What the best way to do this?**

(a) Use the browser feature in the slide design task pane to find the file that file that has your design template and apply it to the current file

(b) Copy and paste the slide with the design template you want to include the new presentation; inserted slide will inherit the design

(c) Save the presentaion that has the design the template with a new name and then use a new file to your presentation

(d) All of the above

**31. How many different predefined voucher format provided by Tally?**

(a) 10 (b) 12 (c) 14 (d) 16

**32. It is use while recording receipts and issues of inventory**

(a) stock item (b) stock group

(c) stock receipt (d) stock issue

**33. To alter details of a company**

(a) Gateway to Tally > F2: Cmplnfo > Alter

(b) Gateway to Tally > F3: Cmplnfo > Alter

(c) Gateway to Tally > F4: Cmplnfo > Alter

(d) Gateway to Tally > F1: Cmplnfo > Alter

**34. To set the details in the account master through**

(a) Gateway to Tally > F12: configure> Accts/Inv info

(b) Gateway to Tally > F13: configure>Accts/Inv info

(c) Gateway to Tally > F14: configure>Accts/Inv info

(d) Gateway to Tally > F15: configure>Accts/Inv info

**35. This is used to configure features while making voucher entry**

(a) Gateway to Tally > F10: configure> Voucher Entry

(b) Gateway to Tally > F11: configure> Voucher Entry

(c) Gateway to Tally > F12: configure> Voucher Entry

(d) Gateway to Tally > F13: configure> Voucher Entry

**36. Which of the following is capable of conducting modulated light transmissions?**

(a) Category 3 UTP (b) Category 5 UTP

(c) Fiber (d) Coax

**37. Which of the following is the most expensive to install and terminate?**

(a) Fiber optic (b) Coaxial

(c) Category 4 UTP (d) Category 5 UTP

**38. What is the best way to avoid a catastrophic loss of computer data?**

(a) Make backup copies of data

(b) Save all data to floppy disks

(c) Encrypt the data and backup to CD-R

(d) Check for viruses and worms

**39. Which of the following are examples of magnetic storage media? (Select all that apply)**

(a) Zip disk (b) CD-ROM

(c) Floppy disk (d) DVD

**40. Which of the following has the largest storage capacity for removable media?**

(a) Floppy disk (b) CD-ROM

(c) DVD (d) DVD

**41. Control Unit (CU) is called the …..of a computer.**

(a) heart

(b) never center or brain

(c) primary memory

(d) All of these

**42. The programs designed to govern the computer hardware system are called the**

(a) System software

(b) application software

(c) utility software

(d) All of these

**43. It is the name given to main computer equipment and its peripheral devices**

(a) software (b) hardware

(c) operating System (d) None of these

**44. software designed for a specific purpose/ application such as pay calculations, processing of examination result etc are known as**

(a) utility software

(b) system software

(c) application software

(d) customized software

**45. In computer terminology, a complier means**

(a) a person who computers source programs

(b) the same thing as a programmer

(c) a key puncher operator

(d) a program which translates high level language program to machine language

**46. Xcopy command can copy**

(a) individual file or group of files

(b) directories including sub-directories

(c) to disketee of a different capacity

(d) All of these

**47. Which command is used to make a new directory?**

(a) Md (b) Cd

(c) Rd (d) None of these

**48. Full form of MS-DOS is**

(a) Micro System Disk Operating System

(b) Micro simple Disk Operating System

(c) Micro soft Disk Operating System

(d) Micro Soft Disk of System

**49. Operating system is like a**

(a) parliament (b) secretary

(c) government (d) None of these

**50. Format command is used to**

(a) prepare a blank disk

(b) create a new blank disk from a use one (c) Both ‘a’ and ‘b’

(d) None of these

**51. Cut operation can also be accomplished by using the shortcut key**

(a) Ctrl +X (b) Ctrl +Y

(c) Ctrl + V (d) Ctrl + A

**52. Which alignment makes sure that none of the edges of text appear ragged?**

(a) Right (b) Left

(c) Centre (d) Justified

**53. Total height of a line of text including extra spacing is known as**

(a) line spacing (b) break spacing

(c) paragraph spacing (d) indentation

**54. Placement of text going past the right merging to the next line**

(a) space (b) margin

(c) word wrap (d) spooling

**55. The distance between text boundaries and page margins**

(a) indent (b) tab

(c) margin (d) spacing

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | C | 2 | C | 3 | B | 4 | B | 5 | C |
| 6 | C | 7 | D | 8 | A | 9 | C | 10 | A |
| 11 | B | 12 | C | 13 | A | 14 | C | 15 | A |
| 16 | B | 17 | B | 18 | A | 19 | C | 20 | A |
| 21 | C | 22 | B | 23 | B | 24 | D | 25 | D |
| 26 | B | 27 | B | 28 | C | 29 | C | 30 | A |
| 31 | D | 32 | A | 33 | B | 34 | A | 35 | C |
| 36 | C | 37 | A | 38 | A | 39 | A,c | 40 | C |
| 41 | B | 42 | A | 43 | B | 44 | C | 45 | D |
| 46 | D | 47 | A | 48 | C | 49 | C | 50 | C |
| 51 | A | 52 | D | 53 | A | 54 | C | 55 | a |

**MODEL TEST PAPER 4**

**1. the primary job of the operating system of a computer is to**

(a) command resources

(b) be user friendly

(c) provide utilities

(d) All of these

**2. The operating system of a computer series as a software interface between the user and**

(a) hardware (b) peripheral

(c) memory (d) screen

**3. The term ‘operating system’ refers to**

(a) a set of programs which controls computer working

(b) the way a computer operator works

(c) conversion of high level language into machine code

(d) the way a floppy disk driver operates

**4. Operating system is**

(a) a collection of hardware components

(b) a collection of input-output devices

(c) a collection of software routines

(d) All of these

**5. Operating system is**

(a) links a program with the subroutines it references

(b) provides a layered, uses-friendly interface

(c) enables the programmer to draw a flow chart

(d) All of the above

**6. The following command set is correct according to their function**

(a) RD can MD

(b) DEL and ERASE

(c) CD and RD

(d) COPY and RENAME

**7. Which command is used to change the file name?**

(a) Ren (b) Rename

(c) Both ‘a’ and ‘b’ (c) None of these

**8. Which working with MS-DOS, which command is used to copying the files to transfer one PC to another one?**

(a) Rename (b) Path

(c) Dir (d) Copy

**9. RESTORE command is used to**

(a) restore files form disks made using the BACKUP command

(b) restore files which are deleted

(c) restore files from recycle bin

(d) restore files which are deleted recently

**10. The vol command is used to**

(a) see the value of list

(b) see the variety of language

(c) see the disk volume label

(d) see the volume of largest

**11. Preset column position of text**

(a) formatting (b) Merging

(c) tab stop (d) indent

**12. The distance between the text and the paper edge**

(a) margin (b) formatting

(c) space (d) break

**13. The general arrangement of text in the document**

(a) indent (b) formatting

(c) space (d) break

**14. A temporary storage are, used generally for cut/copied of text or graphics**

(a) buffer (b) clip board

(c) window (d) None of these

**15. The text layout within a paragraph with respect to document margins**

(a) line alignment

(b) space alignment

(c) text alignment

(d) paragraph alignment

**16. Which field allow to select items form drop down list?**

(a) An OLE field

(b) A memo field

(c) A lookup field

(d) A hyperlink field

**17. What did the first tale analyzer do?**

(a) Analyse the data in a set of flat files and automatically create a relational database system form that information

(b) Provide a graphic way to design relational database

(c) Automate process of connecting tables to SQL server

(d) None of these

**18. Pivot table reports are good for**

(a) analyzing large amounts of data

(b) turning tables upside down

(c) breaking spreadsheet data into multiple worksheet

(d) None of the above

**19. A report form**

(a) appears on the computer monitor during data entry

(b) is used during report generation to format data

(c) Both ‘a’ and ‘b’

(d) all of the above

**20. Which of the following columns cannot be found in the macro design window?**

(a) Arguments column

(b) Comment column

(c) Conditions column

(d) Actions column

**21. Book1 is an example of how………..are numbered and named during each work session.**

(a) Active cell (b) formula bar

(c) menu bar (d) name box

**22. Which of the following display the contents of the active cell?**

(a) Active cell (b) Formula bar

(c) Menu bar (d) Name box

**23. Graphics objects on a chart are used to**

(a) add emphasis to chart data

(b) add interest to a chart

(c) help explain the chart data

(d) All of these

**24. What does SUMIF function do?**

(a) Adds up cell values based on a condition

(b) Adds all the numbers in a range of cells

(c) Returns a subtotal in a list or database

(d) All of these

**25. You can insert labels for**

(a) all the data markers on a chart

(b) a data series

(c) a selected data marker

(d) All of these

**26. Which of the following options in the printer dialog box would you select to print slides 5 and 12 in a presentaion?**

(a) Slides (b) Custom show

(c) Current slide (d) All of these

**27. Which of the following toolbars provides different options in various master views?**

(a) Common tasks toolbar

(b) Drawing toolbar

(c) Formatting toolbar

(d) Standard toolbar

**28. You can tell when an object is active because**

(a) the object is highlighted

(b) eight small sizing handles appear surrounding the text

(c) a box frame appears surrounding the text

(x) Both ‘b’ and ‘c’

**29. Which of the following is not an option when printing handouts?**

(a) Six slides per page

(b) Five slides per page

(c) Three slides per page

(d) Two slides per page

**30. What’s the best way to design the layout for your slides?**

(a) Create layouts for slides, handouts and notes using the master layout dialog box in slide master view

(b) For each new slide, select a layout for the slide layout task pane

(c) Apply templates form the slide design task pen

**31. To make an entry of the transaction in a bank receipt voucher**

(a) Gateway of Tally > Accounting Vouchers >F5: Receipts> Select Bank Receipt

(b) Gateway of Tally > Accounting Vouchers >F6: Receipts> Select Bank Receipt

(c) Gateway of Tally > Accounting Vouchers >F7: Receipts> Select Bank Receipt

(d) Gateway of Tally > Accounting Vouchers >F8: Receipts> Select Bank Receipt

**32. To make an entry of the transaction in a contra voucher**

(a) Tally > Accounting Voucher > F4: contra

(b) Tally > Accounting Voucher > F3: contra

(c) Tally > Accounting Voucher > F2: contra

(d) Tally > Accounting Voucher > F1: contra

**33. To make an entry to the transaction in a bank payment voucher**

(a) Tally > Accounting vouchers > F6: Payment

(b) Tally > Accounting vouchers > F5: Payment

(c) Tally > Accounting vouchers > F4: Payment

(d) Tally > Accounting vouchers > F3: Payment

**34. To make an entry of the transition in a purchase voucher**

(a) Tally > Accounting vouchers > F12: Purchase

(b) Tally > Accounting vouchers > F11: Purchase

(c) Tally > Accounting vouchers > F10: Purchase

(d) Tally > Accounting vouchers > F11: Purchase

**35. To make an entry of the transaction in a sales voucher**

(a) Tally > Accounting vouchers > F8: Sales

(b) Tally > Accounting vouchers > F7: Sales

(c) Tally > Accounting vouchers > F6: Sales

(d) Tally > Accounting vouchers > F5: Sales

**36. Which of the following are concerns when using tapes as a backup method? (Select all that apply)**

(a) You are unable to reuse the data

(b) It is extremely difficult to restore the data

(c) If a crash occurs, you may have to re-enter data

(d) Data transfers during restores may be slow

**37. Which of the following media is one of the oldest media designed to store data, but should be carefully checked with antivirus software before restoration?**

(a) Magnetic tape (b) Laptops

(c) Hard drives (c) CDR

**38. Which of the following media is a relatively new media designed to store data, but should be carefully checked with antivirus software before restoration?**

(a) Magnetic tape (b) Laptops

(c) Hard drives (c) CDR

**39. Your company has decided to dispose of a few of the older computers that once stored critical data. What should you do first?**

(a) Use Western Digital Clear (wdclear) to low-level format the hard disk

(b) Use FIPS to overwrite all data on the hard disk with zeroes

(c) Use a demagnetizer to demagnetize the hard disk

(d) Remove all the files and flooders on the hard disk

**40. Which of the following media is used for fault tolerant RAID arrays?**

(a) Magnetic tape (b) Laptops

(c) Hard drives (c) CDR

**41. Which of the following is an example of computer software?**

(a) Impact printer (b) Console

(c) Payroll package (d) OCR

**42. Programmers use a variety of…………to communicate instructions to the computer.**

(a) programming languages

(b) system languages

(c) high level languages

(d) low level languages

**43. C++ is**

(a) a procedure-oriented language

(b) a problem oriented language

(c) an-object-oriented language

(d) None of these

**44. Which of the following languages makes use of memories to interact with computer system?**

(a) Machine language

(b) Assembly language

(c) C++

(d) java

**45. VDU is used as a(n)**

(a) input unit (b) output

(c) processing (d) storage unit

**46. in MS-DOS you can use small or capital letter of combination of both to enter a command but internally MS-DOS work with**

(a) small letter (b) capital letter

(c) both ‘a’ and ‘b’ (d) None of these

**47. The maximum length in DOS command is**

(a) 80 chars (b) 137 chars

(d) 100 chars (d) 8 char

**48. Which statement is valid about TEM command?**

(a) Time command is used to display and allow changes to the system time

(b) Time format can be changed by changing in country setting in config.sys file

(c) MS DOS displays the time in 12-hour or 24-hour format

(d) All the above

**49. Which command is used to see the sub-directory structure of drive?**

(a) Tree (b) List

(c) Subdir (d) Subtree

**50. Which command is used to display the sub-directory structure of the currently logged drive and pause the screen display after each screen full of the information?**

(a) Tree (b) Drltree/f

(c) Dir|lmore (d) Tree|more

**51. A feature supported by word which converts shorthand’s to longer strings**

(a) auto correct (b) page setup

(c) paragraph (d) word wrap

**52. A document that contains text to be merged into a main document to rebate letters or other merged**

(a) merging (b) data source

(b) clip board (d) alignment

**53. The extra space inside margins to seas up binding**

(a) margin (b) spacing

(c) indent (d) gutter margin

**54. A paragraph format in which the first line of a paragraph starts feather to the left than in subsequent lines**

(a) hanging (b) gutter margin

(c) formatting (d) spacing

**55. The process of providing indent**

(a) settings (b) formatting

(c) indentation (d) margining

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | d | 2 | A | 3 | A | 4 | C | 5 | B |
| 6 | B | 7 | C | 8 | D | 9 | A | 10 | C |
| 11 | C | 12 | A | 13 | B | 14 | B | 15 | C |
| 16 | C | 17 | A | 18 | A | 19 | B | 20 | C |
| 21 | D | 22 | B | 23 | D | 24 | A | 25 | D |
| 26 | A | 27 | A | 28 | A | 29 | B | 30 | B |
| 31 | D | 32 | A | 33 | B | 34 | D | 35 | A |
| 36 | C,d | 37 | A | 38 | D | 39 | C | 40 | C |
| 41 | D | 42 | A | 43 | C | 44 | B | 45 | B |
| 46 | B | 47 | B | 48 | D | 49 | A | 50 | D |
| 51 | C | 52 | B | 53 | D | 54 | A | 55 | c |

**MODEL TEST PAPER 5**

**1. compouter memory contains microchips of**

(a) RAM (b) ROM

(c) PROM (d) All of these

**2. Primary memory if compared to secondary memory**

(a) fast (b) slow (c) cheap (d) large

**3. The memory is measured in**

(a) kilograms (b) units of density

(c) kilobytes (d) square meter

**4. 1 kilo bytes is equal to**

(a) 1000 bytes (b) 1024 bytes

(c) 10,000 bytes (d) 1,0,000 bytes

**5. Which of the following cannot be termed as operating system?**

(a) DOS (b) UNIX

(c) XENIX (d) WINDOWS

**6. Which command is used to provide access to files located in other directories or disk?**

(a) Tree (b) path (c) Dir (d) Cd

**7. You can copy command.com to your disk form hard disk**

(a) true (b) false

(c) Both ‘a’ and ‘b’ (d) None of these

**8. which command is used to see the contents of a file?**

(a) Type (b) Copy

(c) Ed (d) None of these

**9. Which command is used to see the disk volume label?**

(a) Ver (b) Vol

(c) Version (d) Volume

**10. What is the name of the batch file that is automatically run when MS-DOS is booted?**

(a) Run.bat (b) Config.sys

(c) Config.bat (d) Autoexec.bat

**11. A term used to refer to horizontal page orientation**

(a) portrait (b) alignment

(c) table (d) landscape

**12. A term used to vertical page orientation**

(a) portrait (b) alignment

(c) table (d) landscape

**13. It consists of one or more row cells for quick reference and analysis**

(a) columns (b) table

(c) rows (d) cells

**14. A software package that process textual matter and creates organized documents**

(a) processor

(b) language processor

(c) word processor

(d) page processor

**15. It refers to the text is to be printed length-wise or width-wise**

(a) print layout (b) page orientation

(c) printer layout (d) paragraph

**16. The ascending order of a data hierarchy is**

(a) bit, byte, field, record, file, database

(b) bit, byte, record, field, file, database

(c) byte, bit, field, record, file, database

(d) byte, bit, record, field, file, database

**17. A good query system**

(a) can accept English language commands

(b) allows non-programmers to access information strode in a database

(c) can be accessed only by data pressing professionals

(d) Both ‘a’ and ‘b’

**18. How do you freeze a field a column or field in Microsoft Access?**

(a) Click anywhere in the column and select edit>freeze column form the menu

(b) place an ice cube in the column

(c) Click anywhere in the column and click the freeze button on the toolbar

(d) Right click the column and select freeze columns form the shortcut menu

**19. Within table database view, how can you display associated records from another table?**

(a) Click the expand indicator (+) next to a record

(b) Double click the record

(c) Apply the filter by form command

(d) None of the above

**20. Which of the following is not a command to find specific word or phrases in a database?**

(a) Click the find button on the toolbar

(b) Click the find button on the record navigation button area

(c) Press Ctrl + F

(d) Select Edit>Find form the menu

**21. Tab scrolling buttons**

(a) allow you to view a different worksheet

(b) allow you to view additional worksheet row down

(c) allow you to view additional sheet tabs

**22. All macro keyboard shortcuts include which key**

(a) Alt (b) Ctrl (c) F11 (d) Shift

**23. To open the Format Cells dialog box, press**

(a) Alt +1 (b) Ctrl + 1

(c) Ctrl + shift +1 (d) F1

**24. You can add a hyperlink to your worksheet by pressing**

(a) Alt + k (b) Ctrl + H

(c) Ctrl + k (d) Ctrl + Shift+ K

**25. To move to the previous worksheet, press**

(a) Alt + pgUp (b) Ctrl + Pg Up

(c) Ctrl + PgDn (d) Shift+Tab

**26. Any and every command can e found on the**

(a) drawing toolbar

(b) formatting toolbar

(c) standard toolbar

(d) menu bar

**27. The slide that is used to introduce a topic and set the tone for the presentation is called the**

(a) table slide (b) graph slide

(c) bullet slide (d) title slide

**28. How do you print your slides in a handout that include lines for notes?**

(a) in the print dialog box, select handout and set the number of slides per page to 3

(b) in the print dialog box select handout and set the number of slides per page, then select the include comment page option

(c) in the print dialog box select note page instead of handout.

(d) All of the above

**29. Which of the following is the default page setup orientation for notes pages, outlines and handouts?**

(a) Vertical (b) Landscape

(c) Portrait (d) None of these

**30. What are symbols used to identify items in a list?**

(a) icons (b) Markers

(c) Bullets (d) Graphics

**31. It is written order to any bank to pay a stated sum of money**

(a) postal order (b) cheque

(c) draft (d) withdraw slip

**32. It is a procedure for adjusting the account balance reported by a bank with the a/c balance on the company’s books**

(a) passbook

(b) balance sheet

(c) bank reconciliation

(d) depreciation

**33. To reconciliation all transactions relating to bank accounts**

(a) Tally>Display>Accounts Books>ledge

(b) Tally>Display>Accounts Books>bank

(c) Tally > Display > Accounts Books > Cashbook

(d) Tally > Display > Accounts Books > Passbook

**34. Which key is used to change the menu period?**

(a) F1 (b) F2 (c) F3 (d) F4

**35. Which key is used to select the control voucher available at alteration screens?**

(a) F1 (b) F2 (c) F3 (d) F4

**36. Which of the following are one of the greatest of viruses, which are also a small type of media that are frequently carried from one computer to another?**

**37. Which of the following devices are also known as memory sticks?**

(a) Flashcards (b) Hard drives

(c) CDR (d) Diskettes

**38. Which one of the following is the most dependable authentication tool?**

(a) Flashcard (b) Smartcard

(c) Public key (d) session key

**39. Which of the following is the most dependable authentication tool?**

(a) Flashcard (b) Smartcards

(c) Memory cards (d) Authentication cards

**40. Which of the following are known as the registered ports, according to the IANA?**

(a) Ports 1 to 255

(b) Ports 255 to 1024

(c) ports 1024 to 49151

(d) Ports 1025 to 65535

**41. For faster use of cursor is used**

(a) mouse (b) scroll key

(c) functional key (d) None of these

**42. The speedometer of a car represents**

(a) analogy computer

(b) digital computer

(c) hybrid computer

(d) None of these

**43. What is the amount of waste tape in a magnetic tape having density of 1600 BPI and each record of 80 characters?**

(a) 10.3% (b) 15.3%

(c) 60.3% (d) 90.3%

**44. A floppy rotates @ rpm. What is the rate of reading the data, if each track consists of 50 sectors of 512 bytes each?**

(a) 1,28,000 bytes per second

(b) 2,00,000, bytes per second

(c) 15,000 bytes per second

(d) 300X 50 X 512 bytes per second

**45. a hard disk is made up of**

(a) iron (b) copper

(c) aluminum (d) bismuth

**46. What will be the output of the command prompt $1$p$g?**

(a) <C:\> (b) C:\> (c) C:\> (d) C:\

**47. which among the following are the beast tools for fixing errors on disks?**

(a) Fdisk (b) Scandisk

(c) Chkdsk (d) Fixdek

**48. Which command is used to copy all files form drive a: with extension.txt to the currently longed driver and directory?**

(a) Copy a:\\*.txt (b) Copy\*.txt a:

(c) Copy\*.txt c: (d) Copy\*.txt all.txt

**49. Which command is used to create root directory and FAT on disk?**

(a) Chkdsk (b) Command.com

(c) Format (d) Fat

**50. Which command is used to delete all the files extension.txt on the current drive and directory?**

(a) Del.txt (b) Erase.txt

(c) Del\*.txt (d) Del\*.\*\p

**51. Mail merge involves tow files-Main document and**

(a) file document

(b) second document

(c) data sauce (d) table

**52. A mark often used to add emphasis or distinguish items in a list**

(a) Cell (b) bullet (c) list (d) border

**53. The basic unit of a table**

(a) cell (b) rows

(c) columns (d) None of these

**54. Predefined setting, such as page margins, tab settings etc**

(a) gutter (b) auto (c) default (d) edit

**55. A box displays the available command options or list selections to review or change**

(a) window (b) tabs

(c) directory (d) dialog

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | D | 2 | A | 3 | C | 4 | B | 5 | C |
| 6 | B | 7 | A | 8 | A | 9 | B | 10 | A |
| 11 | D | 12 | A | 13 | B | 14 | C | 15 | B |
| 16 | B | 17 | B | 18 | D | 19 | A | 20 | B |
| 21 | D | 22 | A | 23 | B | 24 | C | 25 | D |
| 26 | D | 27 | D | 28 | A | 29 | C | 30 | C |
| 31 | B | 32 | C | 33 | A | 34 | B | 35 | A |
| 36 | D | 37 | A | 38 | B | 39 | B | 40 | C |
| 41 | A | 42 | A | 43 | D | 44 | A | 45 | C |
| 46 | B | 47 | B | 48 | A | 49 | C | 50 | C |
| 51 | C | 52 | B | 53 | A | 54 | C | 55 | D |

**MODEL TEST PAPER 6**

**1. To store the maximum amount of data, the suggested alternate is**

(a) hard disk (b) floppies

(c) microfilm (c) cartage tape

**2. In case, if the user does not specify the drive, DOS will look on**

(a) a-drive (b) b-drive

(c) C-driver (d) d-driver

**3. Photographic printer prints photograph at**

(a) 100 dots per inch

(b) 400 dots per inch

(c) 600 dots per inch

(d) 1200 dots per inch

**4. What is a cluster?**

(a) Group of files

(b) A type of number system

(c) Group of sectors used in DOS

(d) None of these

**5. Which of the following floppy disk has more capacity?**

(a) 8” floppy disk

(b) 5 ¼” floppy disk

(c) 3 ½” floppy disk

(b) all have similar capacity

**6. Which command is used to delete all the files in the root directory of drive a:?**

(a) A:\del (b) Del\*.\* a:

(c) Del a:\ (d) Erase\*.\*

**7. Which command is used to display a list of deleted files that DOS can undelete?**

(a) Undelete\*.\* (b) Undelete/all

(c) Undelete/list (d) None of these

**8. Which command is used to undelete delete a bunch of files with extension doc that you have just deleted?**

(a) Undelete (b) Undelete\*.doc

(c) Undelete/all (d) All of these

**9. Which file in MS-DOS contains internal command that are loaded during booting process?**

(a) lo.sys (b) Msdos.sys

(c) Command.com (d) Config.sys

**10. Which is the valid filename assign in MS-DOS**

(a) Ram\*.txt (b) Ram?.doc

(c) ram\_$.txt (d) None of these

**11. Sub-divisions of a disk that work like a filing system to help you organize your file**

(a) directory (b) drag

(c) pointer (d) marker

**12. To hold down the mouse button while moving the mouse**

(a) cursor (b) drag (c) disk (d) floppy

**13. A family of types styles, such as Arial, Helvetica etc**

(a) styles (b) font (c)control (d) menu

**14. To combine one or more source of text into a single document**

(a) menu (b) table (c) merge (d) folder

**15. A notice on the screen that informs you of a problem**

(a) frame (b) window

(c) dialog box (d) message

**16. One of the type libraries that you can use to programmatically connect to Microsoft Access data is**

(a) collaborative data objects

(b) active data objects

(c) dynamic data interfaces

(d) None of these

**17. The data in a pivot table report is categorized using**

(a) column headings

(b) items from the pivot table field list

(c) header rows

(d) All of these

**18. Which of the following are common ways to enforce data validation when entering data into an access form?**

(a) Create an input mask to restrict the kind of value that can be entered in positions across the field.

(b) Define a validation rule for that field

(c) Goth ‘a’ and ‘b’

(d) None of these

**19. The purpose of the Add-in Manager is to**

(a) create macros and automate data processing

(b) add or remove data in an existing database

(c) add or remove templates, macros, and wizards

(d) all of the above

**20. Sub-schema can be used to**

(a) Create very different, personalized views of the same data

(b) present information in different formats

(c) hide sensitive information by omitting fields form the subschema’s description

(d) All of the above

**21. Late for your investors meeting? How can you quickly apply professional formatting to your sales forecast worksheet?**

(a) Apply special attributes using Format Painter

(b) Apply an Auto Format Style

(c) Apply selected background color

(d) All of these

**22. What excel feature can you use if you want to work with one record at a time?**

(a) Auto complete (b) Auto filter

(c) Data form (d) Sub-fotals

**23. Excel uses this function when creating a data table**

(a) average (b) count (c) sum (d)table

**24. You can copy cell formats from on e cell to another by using the**

(a) backspace key

(b) default font

(c) format painter

(d) formatting toolbar

**25. The accounting style show negative numbers in**

(a) bold (b) object holders

(c) auto layout (d) text holders

**26. The toolbars that are displayed by default in the PowerPoint window includes**

(a) menu bar, standard toolbar, formatting toolbar, drawing toolbar, status bar

(b) menu bar, standard toolbar, formatting toolbar, drawing toolbar, status bar

(c) standard toolbar, formatting toolbar, drawing toolbar, status bar

(d) menu bar, standard toolbar, status bar, drawing toolbar

**27. Objects on the slide that hold text are called**

(a) Place holders (b) object holders

(c) auto layout (d) text holders

**28. You have got a bunch of digital holiday photo you want to put into a slide show. What the quickest method?**

(a) Apply multiple-picture layout to several slides and use the clipart icon on the slides to import you picture

(b) On the insert menu, point to the picture, click form file and select your picture n a group for each slid

(c) On the insert menu, point to the picture, click new photo album

(d) All of the above

**29. How would you create the following diagram in PowerPoint?**

(a) Use auto shapes and the drawing toolbar to create the diagram and design it

(b) open the diagram gallery form the drawing toolbar and choose this diagram type

(c) use the chart command on the insert menu to import he diagram

(d) All of the above

**30. Which of the following provides a means of printing out features notes with a miniature slide on a painted page?**

(a) Slides with animation

(b) outline view

(b) Notes page

(c) Audience handout

**31. Which key is used to select the configure screen?**

(a) F14 (b) F11 (c) F12 (d) F10

**33. Which key is used to navigate between accounting reports?**

(a) F5 (b) F1 (c) F8 (c) F9

**34. Which key is used to select a purchase voucher available at accounting voucher creation screen?**

(a) F6 (b) F9 (c) F10 (d) F11

**35. Which key is used to view the month summary available at ledger vouchers screen?**

(a) F6 (b) F7 (c) F8 (d) F9

**36. Which of the following terms could be considered security zones? (Select all that apply)**

(a) Intranet (b) Internet

(c) DMZ (d) Extranet

**37. you have decided to create a DMZ to allow public access to your business assets. Which of the following should you place within the DMZ? (Select all that apply)**

(a) Web server (b) Proxy server

(c) E-mail server (d) FTP server

**38. Which of the following security zones is considered to be a private company network?**

(a) Forward lookup zone

(b) Internal lookup Zone

(c) Intranet

(d) Internet

**39. Which of the following characteristics of an intranet are true? (Select all that apply)**

(a) An intranet can be a part of a Local Area Network (LAN)

(b) An intranet is designed to be publicly available

(c) An intranet can work with Wide Area Network (WAN)

(d) An intranet may be restricted to a community of users

**40. Which of the following security zones is designed to allow one company to connect to another company through trust relationships and possible tunneling technology:?**

(a) Intranet (b) DMZ

(c) Extranet (d) Internet

**41. When was the floppy disk invented?**

(a) 1971 (b) 1972 (c) 1974 (d) 1976

**42. Which of the following is a part of hard disk?**

(a) Oxide Media

(b) Red write Head

(c) Constant Spin Motor

(d) All of these

**43. The second hard disk of the personal computer is called**

(a) a-drive (b) b-drive

(d) c-drive (d) d-rive

**44. Machine code is a**

(a) Low level language

(b) HLL

(c) software language

(d) Compiler

**45. Which of the following languages is used with an Interpreter?**

(a) COBOL (b) BASIC

(c) PALCAL (d) None of these

**46. While working with MS-DOS which command is used to change the extension o f all filenames ending with .txt to .doc?**

(a) Ren\*.doc\*.txt

(b) Ren\*.txt\*.doc

(c) Ren file.soc file.txt

(d) Ren a: \*.doc \*.txt

**47. while working with MS-DOS which command is used to combine file 1 plus file2 into new file named file3?**

(a) Copy file3 file1+file2

(b) Copy file1+file2 file3

(c) Copy file1+file1+file3

(d) Copy file2 file1+file3

**48. while working with MS-DOS which command is used to copy all files with extension.txt into one file named all.txt?**

(a) Copy a: \*.txt (b) Copy \*.txt a:

(c) Copy \*.txt c: (d) Copy \*.txt all.txt

**49. While working with MS-DOS, which command is used to more file form one directory to another?**

(a) rename (b) Copy (c) Move (d) Cp

**50. While working with MS-DOS, which command is used to rename a file named file1.doc to file2.doc from a different directory called dir1?**

(a) Ren2.doc\dir\.doc

(b) Ren file 1.doc file2.doc

(c) Ren.doc\dir\.doc

(d) Ren\dir1\file.doc file2.doc

**51. A view that display your document as it will appear when you print it**

(a) Page layout (b) print layout

(c) prints layout (d) page setup

**52. The specific placement of graphic, tables and paragraphs on a page**

(a) menu (b) position

(c) placement (d) setup

**53. A graphical bar displayed across the top of the document window**

(a) line (b) scale (c) ruler (d)slide

**54. An invisible area at the left edge of a document window used to select text with the mouse**

(a) selection bar (b) scroll bar

(c) slid bar (d) status bar

**55. A measured positions for placing and aligning text at a specific place on a line**

(a) slide (b) tab stop

(c) scale (d) position

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | C | 2 | D | 3 | D | 4 | C | 5 | C |
| 6 | C | 7 | C | 8 | B | 9 | C | 10 | C |
| 11 | A | 12 | B | 13 | B | 14 | C | 15 | D |
| 16 | B | 17 | B | 18 | C | 19 | C | 20 | D |
| 21 | B | 22 | C | 23 | D | 24 | C | 25 | C |
| 26 | B | 27 | B | 28 | C | 29 | B | 30 | D |
| 31 | C | 32 | C | 33 | D | 34 | A | 35 | B |
| 36 | A,  c,  d | 37 | A,  c,  d | 38 | C | 39 | A,  c,  d | 40 | C |
| 41 | D | 42 | D | 43 | D | 44 | A | 45 | B |
| 46 | B | 47 | B | 48 | D | 49 | C | 50 | D |
| 51 | A | 52 | B | 53 | C | 54 | A | 55 | d |

**MODEL TEST PAPER 7**

**1. Which of the following languages was first developed?**

(a) COBOL (b) BASIC

(c) PALCAL (d) FORTRAN

**2. one major drawback in time sharing mode is that**

(a) the CPU is not utilized

(b) time slice for each program is low

(c) instant program modification is not possible

(d) user’s program is not secured

**3. A source program is written in**

(a) high level language

(b) English language

(c) machine language

(d) symbolic language

**4. Which of the following is essential for using a computer effectively?**

(a) Executive software

(b) Command software

(c) System software

(d) utility Software

**5. The instruction understood by computer is given in which language?**

(a) BASIC (b) Codes

(c) Compiler (d) Machine

**6. While working with MS-DOS which command is used to copy all files from the currently logged drive and directory with the extension.txt to the drive a?**

(a) Copy a.\*.txt (b) Copy \*.txt a:

(c) Copy \*txt c: (d) Copy \*.txt all.txt

**7. which of the following command displays the name of files in sorted order?**

(a) Dir/0: n (b) dir/so

(c) Dir/an (d) Dir/ah

**8. Which command displays the list of all previous commands entered by the used?**

(a) COMMANDS/ALL

(b) KEYDOS

(c) DOSKEY

(d) DIR/ALL

**9. The operating system creates…form the physical computer.**

(a) virtual space

(b) virtual computers

(c) virtual device

(d) None of these

**10. Swapping**

(a) works best with many small partitions

(b) allow many programs to use3 memory simultaneously

(c) allows each program in turn to use the memory

(d) does not work with overlaying

**11. MS-Word allow creation of which type of documents by default?**

(a) .DOT (b) .PDF (c) .DOC (d) .TXT

**12. Which of the following is not a part to a standard office suit**

(a) File manager (b) Image editor

(c) Word processor (d) Data base

**13. An animated character that gives help in MS-OFFICE?**

(a) office assistant (b) office worker

(c) comic assistant (d) all of these

**14. Which of the following are valid minimum and maximum zoom sizes in MS-office?**

(a) 10,500 (b) 10,1000

(c) 10,100 (d) 20,200

**15. What option will be used to change the word from ‘tll’ to ‘tall’?**

(a) Add (b) change

(c) Correct (d) Insert

**16. if you are entering data in a form, a quick way to copy a value from the previous record is to press.**

(a) Ctrl + (b) F6

(c) Ctrl +D (d) None of these

**17. What is the abbreviation used for a software package that permits the user to create, retrieve and maintain records in a database?**

(a) DASD (B) FMS

(c) EMS (d) DBMS

**18. A repository for data, usually converging some specific topic is called**

(a) data acquisition (b) data bank

(c) real time (d) database

**19. A notation for defining the form and structure of data is known as**

(a) data description language

(b) binary language

(c) data channels

(d) data definition language

**20. A data item, which is not broken down into smaller units, is**

(a) data element

(b) elementary data item

(c) data entry

(d) database management

**21. You can use drag and drop to embed excel worksheet data in word document**

(a) by dragging a range of excel data to the word button on the taskbar while pressing the Ctrl key

(b) by dragging a range of excel data to the word button on the taskbar while pressing the Shift key

(c) by displaying both application side-by-side and dragging a selected range of excel data into the word application window while pressing the Ctrl key

(d) Both ‘a’ and ‘c’

**22. It is a group of cells that from a rectangle on the screen**

(a) calculation (b) formula

(c) range (d) rang address

**23. What term describes explanatory text attached to a cell?**

(a) callout (b) comment

(c) Dialog (d) Extension

**24. The drag and drop method of copying or moving**

(a) can be used between worksheets but not workbook

(b) can be used between worksheets but not worksheets

(c) can be used between workbook but not worksheet

(d) None of the above

**25. 3-D reference in a formula**

(a) can not be modified

(b) only apperars on summary worksheet

(c) limits the formatting options

(d) spans worksheets

**26. Which comand brings you to the first slide n your presentation?**

(a) Next slide button (b) page up

(c) Ctrl + home (d) Ctrl + end

**27. You were giving your presentation and you need to click a slide that is few slides back. How do you get there?**

(a) Press ESC to get back into a normal view; click the slide thumbnail in normal view then click the resume slide show button

(b) Press backspace until your desired slide

(c) Right click, point to go on the shortcut menu, point to by title, and click the slide you want to go to

(d) All of the above

**28. Which of the following should you do to bring a bullet back to a previous level?**

(a) Press the shift + tab keys

(b) Press the shift key

(c) Press the entry key

(d) Pres the tab key

**29. Good design determines**

(a) Credibility (b) Readability

(c) First impression (d) All of these

**30. To make a selection of on our presentaion, use a different design template from the other slides, what do you do?**

(a) Select the slides thumbnails in that section and apply a different color scheme

(b) Select the slides thumbnails in that section and apply a different design temples

(c) Select one of the slide in the section you want to change, customize the fonts and colors and use the format painter tool to apply those styles to the other slides in the section

(d) All of the above

**31. Which key is used to select the receipt vouchers available at accounting voucher creation screens?**

(a) F3 (b) F4 (c) F5 (d) F6

**32. Which key is used to reconcile bank accounts available at ledger voucher screen?**

(a) F5 (b) F6 (c) F7 (d) F8

**33. Which key is used to show / hide gross profit earned on sales made available at the item monthly screen?**

(a) F1 (b) F2 (c) F3 (d) F4

**34. Which key is used to view other stock items summary available at the item monthly screen?**

(a) F2 (b) F4 (c) F3 (d) F4

**35. Which key is used to view the list of ledgers a Vouchers screen?**

(a) F2 (b) F3 (c) F4 (d) F5

**36. When you think of Virtual Local Area Network (VALNs), how are workstations connected? (select all that apply)**

(a) Same functional department

(b) Same LAN geographic location

(c) Same group of users

(d) Same application

**37. Which one of the following is software used to logically connect workgroups, thereby improving network performance for group members in different physical locations?**

(a) Virtual Private Network (VPN)

(b) Virtual Local Area Network (VLAN)

(c) Remote Authentication Dial-in User Service (RADIUS)

(d) Network Address Translation (NAT)

**38. you are in charge of a large network and have been using many devices. You finally want to subnet your network and allow users form the sales department in one office to communicate with sales representatives in another city. Which device should you use to improve connectivity?**

(a) NAT (b) VLAN

(c) brouter (d) Bridge

**39. A company desires to use a private addressing scheme for their LAN users. What solution should they implement?**

(a) NAT (b) Honey pot

(c) IDS (d) Proxy server

**40. which of the following is relatively more secure than proxy, because it assigns private IP addresses to the clients on your LAN, acting as a firewall?**

(a) RADIUS

(b) Internet control Message Protocol (ICMP)

(c) Network Address Translation (NAT)

(d) ICMP Router discovery Protocol (IRDP)

**41. Which of the following terms refers to the degree to which data in database system are accurate and correct?**

(a) Data security

(b) Data validity

(c) Data independence

(d) Data integrity

**42. A set of programs that handle firm’s data base responsibilities is called a**

(a) Database Management System (DBMS)

(b) Database Processing System (DBPS)

(c) Data Management System (DMS)

(d) All of the above

**43. Which of the following is not relational database?**

(a) dBase IV (d) 4th Dimension

(c) FoxPro (d) Reflex

**44. Which is used to provide the sight information to the right person at the right time for proper decision making?**

(a) DBMS (b) MIS (c) ISO (d) PSO

**45. dBase-III was developed by**

(a) Dec (b) IBM

c) Ashton-tate (d) All of these

**46. The auto calculate feature**

(a) can only add values in a range of cells

(b) provides a quick way to view the results of an arithmetic operation on a range of cells

(c) automatically creates formulas and adds them to a worksheet

(d) can only be used to create embedded charts

**48. What chart object is horizontal or vertical line that extends across the plot area to make it easier to read and follow the values?**

(a) Category axis (b) Data marker

(c) data point (d) Gridline

**49. A value used in a formula that does not change is called a**

(a) cell address (b) constant

(c) function (d) range

**50. Suppose you have columns of data that span more than one printed page. How can you automatically print the column headings on each page?**

(a) Click page setup on the file menu, click the sheet tab and enter the row that contains3these column headings under print titles

(b) Click page setup on the file menu, click the page tab, click the options button, the enter your choices

(d) Click page setup on the file menu, click the sheet tab and make a selection under the print heading

(d) All of the above

**51. your presentation is ready to go, but you don’ know if PowerPoint is installed on the computer, you will use to present with what’s the safe way?**

(a) Save your presentations a web page

(b) Set up you presentaion to be ‘browse as a kiosk’

(c) Use the Pack and Go wizard

(d) All of the above

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | A | 2 | D | 3 | A | 4 | C | 5 | D |
| 6 | B | 7 | A | 8 | C | 9 | B | 10 | C |
| 11 | C | 12 | A | 13 | D | 14 | A | 15 | D |
| 16 | A | 17 | D | 18 | B | 19 | D | 20 | B |
| 21 | D | 22 | C | 23 | B | 24 | C | 25 | D |
| 26 | C | 27 | C | 28 | A | 29 | D | 30 | B |
| 31 | D | 32 | A | 33 | D | 34 | B | 35 | C |
| 36 | A,  c,  d | 37 | B | 38 | B | 39 | A | 40 | C |
| 41 | D | 42 | D | 43 | D | 44 | B | 45 | C |
| 46 | B | 47 | B | 48 | D | 49 | B | 50 | A |

**MODEL TEST PAPER 8**

**1. Artificial intelligence is associated with which generation?**

(a) First generation

(b) Second generation

(c) Fifth generation

(d) Sixth generation

**2. Which operation is not performed by computer?**

(a) inputting (b) Processing

(d) controlling (d) Understanding

**3. Fifth generation computer are also known as**

(a) knowledge information processing system

(b) very large scale integration (VLSI)

(c) transistor

(d) None of these

**4. The bran o f any computer system is**

(a) control unit

(b) arithmetic logic unit

(c) central processing unit

(d) storage unit

**5. Pick the one that is used for logical operati8ons or comparisons such as less than equal to or greater then**

(a) arithmetic and logic unit

(b) control unit

(c) Both of these

(d) None of these

**6. What options used to use a paragraph at another place after removing it completely from first place?**

(a) Rotate (b) Delete

(c) Cut-paste (d) Move

**7. A program which helps to create written document and lets you go back and make corrections as necessary**

(a) home row keys (b) tool bar

(c) folder (d) word processor

**8. Graphics for word processor**

(a) peripheral (b) clipart

(c) highlight (d) execute

**9. What type of software is used for creating letters papers and other documents?**

(a) Database

(b) Word Processor

(c) Spreadsheet

(d) Operating Program

**10. What does the Ctrl + I shortcut key accomplish in MS-Word?**

(a) It converts selected text into the next large size of the same font

(b) It adds a line break to the document

(c) It makes the selected text bold

(d) It applies Italic formatting the selected text

**11. The modify operation is likely to be done after**

(a) delete (b) look up

(c) insert (d) All of these

**12. The criteria BETWEEN 1/2/99 would which is proper**

(a) Display records between the dates 1/2/99 and 1/1/00

(b) Display records between the dates 1/2/99 and 12/31/99

(c) Display records whose dates equaled 1/1/99 or 12/31/99

(d) All of the above

**13. DDP stands for**

(a) Distributed Double Processing

(b) Distributed Decimal Processing

(c) Distributed Data programming

(d) Distributed Data Processing

**14. To see sales amount figures totaled, into which drop area would you drag that field?**

(a) Drop column fields here

(b) Drop row fields here

(c) Drop data items here

(d) None of these

**15. Which access feature do you use to develop applications that host access data on the web?**

(a) Dynamic web data

(b) Data access pages

(c) Html data pages

(d) None of these

**16. A fast way to add up this column of number is to click in the cell below the numbers and then**

(a) Click subtotals on the data menu

(b) view the sum in the formula bar

(c) click the auto sum button on the standard toolbar, then press enter

(d) All of the above

**17. To view a cell comment**

(a) Click the edit comment commands on the insert menu

(b) click the display comment command on the window menu

(c) position the mouse pointer over the cell

(d) click the comment command on the view menu

**18. When you want to insert a blank embedded excel object in a word document you can**

(a) Click the object command on the insert menu

(b) Click the office links button on the standard toolbar

(c) click the create worksheet button on the formatting toolbar

(d) click the import excel command on the file menu

**19. Say that you want to paste a formula result- but not the underlying formula-to another cell. In excel 2002, you would copy the cell with the formula, then place the insertion point in the cell you want to copy to what next?**

**20. You can select single range of cells by**

(a) clicking the upper-left cell in a group of cells and then pressing the Shift key while clicking the lower right cell in a group of cells

(b) pressing the Ctrl key while dragging over the desired cells

(c) pressing the Shift key and an arrow key

(b) dragging over the desired cells

**21. Which of the following should you use if you want all the slides in the presentation to have the same look?**

(a) The slide layout option

(b) the add slide option

(c) Outline view

(d) A presentation design template

**22. Line spacing refers to the**

(a) space between the lines of text

(b) height of the line

(c) length of the line

(d) Both ‘a’ and ‘c’

**23. Which of the following uses the spelling and grammar feature to indicate an incorrect spelling?**

(a) The incorrect word appears in all capital letters

(b) The incorrect word has a wavy red line under it

(c) The incorrect word appears italicized

(d) The incorrect word appears bold

**24. Which of the following bypasses the print dialog box when printing individual slides or an entire presentation?**

(a) File, print preview

(b) The print button

(c) File, print

(d) Ctrl + P

**25. The handout master contains place holders for alll of the s following excpte**

(a) slide number (b) title

(c) footer (d) header

**26. Which key is used to close a company?**

(a) Alt + F1 (b) Alt + F2

(c) Alt + F3 (d) Alt + F4

**27. Which key is used to chang the system period?**

(a) Alt + F5 (b) Alt + F2

(c) Alt + F4 (d) Alt + F6

**28. Which key is used to select the company Infor menu?**

(a) Alt + F7 (b) Alt + F8

(c) Alt + F3 (d) Alt + F0

**29. Which key is used to view sales and purchase register summary on a quarterly basis?**

(a) Alt + F6 (b) Alt + F5

(c) Alt + F2 (d) Alt + F1

**30. Which key is used to view the filters screen where the range of information can be specified?**

(a) Alt + F12 (b) Alt + F10

(c) Alt + F9 (d) Alt + F8

**31. What is the primary purpose of Network Address Translation (NAT)?**

(a) Multiple users sharing one IP address for Instant Messenger (IM)

(b) Hiding the IP address of the internal network form those outside of the network

(c) Showing the IP addressed of the external network to clients on the internal network

(d) Single users gaining access to multiple e-mail accounts

**32. Which of the following are true statement about network Address Translation (NAT)? (Select all that apply)**

(a) Provide for private addressing ranges for internal network

(b) Hides the true IP addresses of internal computer system

(c) Ensures that private addresses can be globally routable

(d) Translates private IP addressee into registered Internet IP address

**33. Which of the following is an example of a private IP address, which is not to be used on the Internet?**

(a) 10.13.40.15 (b) 131.10.42.5

(c) 129.101.22.15 (d) 193.10.143.105

**34. Which of the following is an example of a private IP address, which is not to be used on the Internet?**

(a) 171.15.40.15 (b) 172.46.32.2

(c) 171.90.22.1 (d) 172.16.12.5

**35. Which of the following is an example of a private IP address, which is not to be used on the Interned?**

(a) 172.111.12.15 (b) 192.168.141.15

(c) 192.165.142.15. (d) 19.176.134.15

**36. How do you add degrees of transparency to shapes such as arrows, so that the slide background shows through?**

(a) Use #D style 4 button on the drawing too.bar

(b) Use the Set Transparent color button on the Picture toolbar

(c) Use the Transparency slide in the Format Auto Shapes dialog box

(d) All of the above

**37. Material consisting of text and numbers is best presented as**

(a) a table slide (b) a bullet slide

(c) a title (d) All of these

**38. Which of the following displays when an image is selected?**

(a) Add clipart only if it relates to your topic

(b) Be sure to place at least one clipart imam per slide

(c) Resize the image so it takes up as much space as your text

(d) Both ‘a’ and ‘b’

**39. The Microsoft clip gallery allows you to**

(a) add word art images to slide

(b) spell check your presentation

(c) add clipart images to a slide or slides

(d) add slides to a presentation

**40. Which command select all object at one time when selecting multiple objects to be deleted?**

(a) Alt + a (b) Ctrl + a

(c) Shift + Enter (d) Edit, Select All

**41. Which key is used to create a ledger at a voucher screen?**

(a) Alt + A (b) Alt + N

(c) Alt + O (d) Alt + D

**42. Which key is used to add multiple column to a report (Auto column)?**

(a) Alt + M (b) Alt + N

(c) Alt + O (d) Alt +P

**43. Which key is used to print reports?**

(a) Alt + A (b) Alt + B

(c) Alt + P (d) Alt +D

**44. Which key is used to create/alter/shut company?**

(a) Alt + F1 (b) Alt + F3

(c) Alt + F2 (d) Alt + F4

**45. Which key is used to view the detailed report of a company ?**

(a) Alt + F4 (b) Alt + F3

(c) Alt + F2 (d) Alt + F1

**46. Which of the following applies to the networking concept of tunneling? (Select all that apply)**

(a) Private network data is encapsulated or encrypted

(b) Public network data is encapsulated or encrypted

(c) Private data is transmitted over a public network

(d) Private network data is lost in a black hole

**47. There are several tunneling protocols. Which of the following are types of VPN remote computing tunneling protocols? (Select all that apply)**

(a) LP (b) L2F (c) L2TP (d) PPTP

**48. IDS may be configured to report attack occurrences. You just received a notification that an attack occurred, but after checking, you find that it really wasn’t an attack at all. What is the term for this type of alarm?**

(a) True position (b) False positive

(c) True negative (d) False negative

**49. You are looking for a security tool to exam or audit system configuration and find areas that pose security risks in conjunction with your intrusion detection plan. What tool should you use?**

(a) DES (b) KAS (c) RSA (d) NAT

**50. which of the following terms relates to sending on ICMP request to each IP address on a subnet and waiting for replies?**

(a) Port scanning (b) Echo scanning

(c) Ping scanning (d) Node scanning

**51. which of the following terms relates to sending an initial SYN packet, receiving an ACK packet and then immediately sending an RST packet?**

(a) Port scanning

(b) TCP full scanning

(c) Ping scanning

(d) TCP half scanning

**52. Which of the following is most use full when detecting network intrusions?**

(a) Audit polices

(b) Audit trails

(c) Access control polices

(d) Audit practices

**53. which of the following describes how a network-based IDS acquires data**

(a) Passive (b) Active

(c) Very quiet (d) Very noisy

**54. Which of the following describes how a network-based IDS acquires data?**

(a) Provide reliable, real-time intrusion data

(b) Remains passive and transparent on the network

(c) Uses many network or host resources

(d) Becomes active when identifying intrusions

**55. Which of the following intrusion detecti9on systems functions in current or real time to monitor network traffic?**

(a) Network based (b) Host based

(c) Gateway based (d) Router based

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | C | 2 | D | 3 | A | 4 | C | 5 | A |
| 6 | C | 7 | D | 8 | B | 9 | B | 10 | D |
| 11 | B | 12 | B | 13 | D | 14 | C | 15 | B |
| 16 | C | 17 | C | 18 | A | 19 | C | 20 | D |
| 21 | D | 22 | A | 23 | B | 24 | B | 25 | B |
| 26 | A | 27 | A | 28 | C | 29 | B | 30 | A |
| 31 | B | 32 | A,  b,  c | 33 | A | 34 | D | 35 | B |
| 36 | C | 37 | A | 38 | D | 39 | C | 40 | D |
| 41 | C | 42 | B | 43 | C | 44 | B | 45 | D |
| 46 | A,  c | 47 | B,  c,  d | 48 | B | 49 | B | 50 | C |
| 51 | D | 52 | B | 53 | A | 54 | A,  b | 55 | A |

**QUESTION PAPER**

**1. What is the permanent memory built into your computer called?**

(a) RAM (b) ROM

(c) CPU (d) CD-ROM

**2. Various applications and documents are represented on the Windows desktop by**

(a) Symbols (b) Labels

(c) Graphs (d) Icons

**3. All the deleted files go to**

(a) Recycles Bin (b) Task Bar

(c) Tool Bar (d) My computer

(e) None of these

**4. In MICR, C stands for**

(a) Code (b) color

(c) Computer (d) Character

(e) None of these

**5. E-male addresses separate the user name for the ISP using the \_\_\_\_\_Symbol.**

(a) & (b) @ (c) % (d) : (e) None of these

**6. The simultaneous processing of two or more programs by multiple processors is**

(a) multiprogramming

(b) multitasking

(c) time-sharing

(d) multiprocessing

(e) None of these

**7. What type of device is a computer printer?**

(a) Input (b) Output

(c) Software (d) Storage

(e) None of these

**8. The contents of ----are lost when the computer turns off**

(a) storage (b) input

(c) output (d) memory

(e) None of these

**9. When you turn on the computer, the boot routine will perform the test**

(a) RAM test (b) disk drive test

(c) memory test (d) power-on self

(e) None of these

**10. When you access to his, your data will remain intact even when the computer is turned off**

(a) RAM (b) motherboard

(c) secondary storage device

(d) primary storage device

(e) None of the above

**11. For creating a document, you use command at File Menu.**

(a) Open (b) Close

(c) New (d) Save

(e) None of the above

**12. Programs form the same developer, sold bundled together, that provide better integration and share common features, toolbars and menus are known as**

(a) software suites

(b) integrated software packages

(c) software processing packages

(d) personal information managers

(e) None of the above

**13. A data warehouse is which of the following?**

(a) Can be updated by the end user

(b) Contains numerous naming conventions and formats

(c) Organized around important subject areas

(d) Contains only current data

(e) None of the above

**14. These servers store and manages files for network users**

(a) Authentication (b) Main

(c) Web (d) File

(e) None of the above

**15. All of the following are examples of real security and privacy risk Except**

(a) hackers (b) spam

(c) viruses (d) identify theft

(e) None of the above

**16. These terminals (formerly known as cash registers) are often connected to complex inventory and sales computer systems**

(a) Data

(b) Sales

(c) Query

(d) point-of –sale (POS)

(e) None of the above

**17. The OSI model is divided into how many processes called layers?**

(a) five (b) six (c) seven

(d) eight (e) None of the above

**18. It is the set of programs that enables your compote’s hardware devices and application software to work together**

(a) management (b) processing

(c) utility (d) System Software

(e) None of the above

**19. These are specially designed computer chips reside inside other devices, such as your car or your electronic thermostat**

(a) servers

(b) Embedded computers

(c) Robotic computers

(d) mainframes

(e) None of the above

**20. The following are all computing devise, except**

(a) notebook computers

(b) cellular telephones

(c) digital scanners

(d) personal digital assistants

(e) None of the above

**21. In a ring topology, the computer in possession of the \_\_\_\_\_\_\_\_can transmit data**

(a) packet (b) data

(c) access method (d) token

(e) None of the above

**22. This part of operating system manages the essential peripherals, such as the keyboard, screen, disk drives, and parallel and serial ports**

(a) basic input/output system

(b) secondary input/ output system

(c) peripheral input/output system

(d) marginal input/output system

(e) None of the above

**23. These type of viruses are often transmitted by floppy disk left in the floppy drive**

(a) Trojan horse (b) Boot sector

(c) Script (d) logic bomb

(e) None of the above

**24. It controls the way in which the computer system functions and provides a way by which users can interact with the computer?**

(a) The platform

(b) Application software

(c) Operating system

(d) The motherboard

(e) None of the above

**25. Servers are computers that provide resources to other computers connected to a**

(a) mainframe (b) network

(c) supercomputer (d) client

(e) None of the above

**26. A goal of data mining includes which of the following?**

(a) To explain some observed event or condition

(b) To confirm that data exists

(c) To analyses data form expected relationships

(d) To create a new data warehouse

(e) None of the above

**27. URL stands for**

(a) Universal Research List

(b) Universal Resource List

(c) Uniform Resource Locator

(d) Uniform Research Locator

(e) None of the above

**28. A database management system (DBMS) is a**

(a) hardware system used to create, maintain and provide controlled access to a database

(b) hardware system used to create, maintain and provide uncontrolled access to a database

(c) software system used to create, maintain and provide uncontrolled access to a database

(d) software system used to create, maintain and provide controlled access to a database

(e) None of the above

**29. Which of the following is NOT a goal of transaction processing system?**

(a) Capture, process and store transactions

(b) Produce a variety of documents related to routine business activities

(c) Reduce manual effort associated with processing business transactions

(d) Produce standard reports used for management decision making

(e) None of the above

**30. A proxy server is used for which of the following?**

(a) To provide security against unauthorized users

(b) To process client requests for web pages

(c) To process client requests for database access

(d) To provide TCP/IP

(e) None of the above

**31. When data changes in multiple lists and all lists are not updated, this causes**

(a) data redundancy

(b) information overload

(c) duplicate data

(d) data inconsistency

(e) None of the above

**32. Words that a programming language has set aside for its own use**

(a) Control worlds (b) Reserved words

(c) Control structures (d) Reserved keys

(e) None of the above

**33. What is the primary difference between viruses and a worm?**

(a) A worm has the ability to self-propagate from an infected user’s computer to other computers

(b) A worm is usually written y a cracker: script bunnies do not have the skills to develop a worm program

(c) A virus is very harmful to the computers is infects: a worm is not a serious a problem

(d) Anti-virus software is effective in fighting viruses but not worms

(e) None of the above

**34. It describe what is database fields**

(a) Structures (b) Field markers

(c) Field definition (d) Field names

(e) None of the above

**35. You must install this on a network if you want to share a broadband internet connection.**

(a) router (b) modem (c) node

(d) cable (e) None of the above

**36. A goal of normalization is to**

(a) minimize the number of relationships

(b) minimize the number of entities

(c) minimize the number of tables

(d) minimize the number of redundancy

(e) None of the above

**37. Granting an outside organization access to internment web pages is often implemented using a (an)**

(a) extranet (b) intranet

(c) internet (d) hacker

(e) None of these

**38. Which term identifies a specific computer on the web and the main page of the entire site?**

(a) URL (b) Web site address

(c) Hyperlink (d) Domain name

(e) None of these

**39. The code that relational database management systems use to perform their database task is referred to as**

(a) QBE (b) SQL

(c) OLAP (d) Sequel Serve

(e) None of these

**40. Chip is a common nickname for a (an)**

(a) transistor (b) resistor

(c) integrated circuit (d) semiconductor

(e) None of these

**41. The purpose of the primary key in a database is to**

(a) unlock the database

(b) provide a map of the data

(c) uniquely identify a record

(d) establish constraints on database operations

(e) None of these

**42. It contains specific rules and words that express the logical steps of an algorithm**

(a) programming language

(b) syntax

(c) programming

(d) logic chart

(e) None of these

**43. The design of the network is called the network**

(a) architecture (b) server

(d) transmission (d) type

(e) None of these

**44. The most frequently used instructions of a computer program are likely to be fetched from**

(a) the hard disk (b) cache memory

(c) RAM (d) registers

(e) None of these

**45. It contains data descriptions and defines the name, data type, and length of each field in the database**

(a) data dictionary (b) data table

(c) data record (d) data field

(e) None of these

**46. Personal logs or journal entries posted on the Web are known as**

(a) list serve (b) Webcasts

(c) blogs (d) data field

(e) None of these

**47. It uses pictures (called icons) and menus displayed on the screen to send commands to the computer system**

(a) command-based user interface

(b) GUI (c) system utility

(d) API (e) None of the above

**48. This manual tells you how to use a software program**

(a) documentation (b) programming

(c) technical (d) user

(e) None of these

**49. Which of the following is NOT a type of broadband Internet connection?**

(a) cable (b) DSL (c) Dial-up

(d) satellite (e) None of these

**50. Software, such as viruses, worms and Trojan horse, that has a malicious intent,3is known as**

(a) spyware (b) adware

(c) spam (d) malware

(e) None of these

**51. In making a field this property show that it cannot be left blank**

(a) numeric (b) required

(c) calculated (d) validated

(e) None of these

**52. It is the process of finding error in software code**

(a) Debugging (b) Compiling

(c) Testing (d) Running (e) None of these

**53. There are viruses that are triggered by the passage of time or on a certain data**

(a) Boot-sector viruses

(b) Macro viruses (c) Time bombs (d) Worms (e) None of these

**54. Linux is which type of operating system?**

(a) Open-source (b) Microsoft

(c) Windows (d) Mac

(e) None of these

**55. What is a backup?**

(a) Restoring the information backup

(b) An exact copy of a system’s information

(c) The ability to get a system up and running in the event of a system crash or failure

(d) All of the above (e) None of the above

**56. Which of the following places the common data elements in order form smallest to largest?**

(a) character, file, record, field, database

(b) character, record, field, database, file

(c) bit, byte, character, record, field, file, database

(e) None of the above

**57. The internet is**

(a) a large network of networks

(b) an internal communication system for a business

(c) a communication system for the Indian government

(d) All of the above

(e) None of the above

**58. These are lists of commands that appear on the screen**

(a) GUIs (b) Icons

(c) Menus (d) Windows

(e) None of the above

**59. Which of the following statement is FALSE concerning file names?**

(a) Files may share the same name or the same extension but not both

(b) Every file in the same folder must have a unique name

(c) File extension is another name for file type

(d) The file extension come before the dot (.) followed by the file name

(e) None of the above

**60. Verification of a login name and password is known as**

(a) configuration (b) accessibility

(c) authentication (d) logging in

(e) None of the above

**61. Which of the following would most likely NOT be symptom of a virus?**

(a) Existing program files and icons disappear

(b) The CD-ROM stops functioning

(c) The Web Brower ones to an unusual home page

(d) odd messages or images are displayed on the screen

(e) None of the above

**62. Compiler is the**

(a) name given to the computer operator

(b) part of the digital machine to store the information

(c) translator of source program to object

(d) part of arithmetic logic unit

(e) operator of Boolean Algebra

**63. Main memory is**

(a) Random Access Memory

(b) Read only Memory

(c) Serial Access Memory

(d) Storage Memory

(e) None of the above

**64. Which of the following is the smallest and fastest computer imitating brain working?**

(a) Supercomputer

(b) Quantum Computer

(c) Param-10, 000

(d) IBM chips

(e) None of these

**65. A compact disc (CD) is a data storage of the type**

(a) Magnetic (b) Optical

(c) Electrical (d) Electromechanical

(e) None of these

**66. Which of the following is not as language for computer programming?**

(a) WINDOWS (b) PASCAL

(d) BASIC (d) All of these

**67. What are the two basic types of memory that your computer uses**

(a) RAM (b) RW/RAM

(c) ROM (d) ERAM

(e) POST

**68. The term gigabyte refers to**

(a) 1024 bytes (b) 1024 kilobytes

(c) 1024 megabytes (d) 1024 gigabytes

(e) None of these

**69. A compute with CPU speed around 100 million instructions per second with the word length of around 64 bits is known as**

(a) super computer (b) mini computer

(c) micro computer (d) macro computer

(e) None of these

**70. What digit are representative of all binary number?**

(a) 0 (b) 1

(c) Both ‘a’ and ‘b’ (d) 3

(e) None of these

**71. To locate a data items for storage is**

(a) Field (b) Feed

(c) Database (d) Fetch

(e) None of these

**72. Off-line operation it the operation of devices without the control of**

(a) Memory (b) CPU

(c) ALU (d) Control unit

(e) None of these

**73. A type of line printer that use an embossed steel band to form the letters printed on the paper is**

(a) Golf ball printer

(b) Dot-matrix printer

(c) Laser printer (d) Band printer

(e) None of these

**74. A software used to convert source program instructions to object instruction is known as**

(a) Compiler (b) Assembler

(c) Interpreter

(d) Language processor

(e) None of these

**75. The chip, used in computers, is made of**

(a) Chromium (b) Iron oxide

(c) Silica (d) Silicon

(e) None of these

**76. Name the first general purpose electronic computer**

(a) ADVAC (b) ADSAC

(c) UNIVAC (d) EDVAC

(e) None of these

**77. The size of commonly used Floppy disk is**

(a) 4.5’’ (b) 3.5’’ (c) 3.25’’ (d) 5.5 (e) None of these

**78. Which of the following statement is wrong?**

(a) Windows XP is an operating system

(b) Linux is owned and sold by Microsoft

(b) Photoshop is a graphical design tool by Adobe

(c) Linux is free and open source software

(e) None of these

**79. Operating system of a computer**

(a) Enables the programmer to draw a flow chart

(b) Links a programs with subroutine with references

(c) Provides a layer, user friendly interface

(d) The way computer operator works

(e) None of these

**80. The term ‘Operating System’ means**

(a) A set of programs which control computer working

(b) Conversion of high level language to machine language

(d) The way computer operator works

(e) None of these

**81. Wild card operators specifies**

(a) can be used when writhing into multiple files

(b) allows several files to be read simultaneously

(c) provide an easy way of groups of related files

(d) are only used when printing the contents of a file

(e) None of the above

**82. The physical arrangement of elements on a page is referred to as a document’s……**

(a) features (b) format

(c) pagination (d) grid

(e) None of these

**83. Most Websites have a main page, the …which acts as a doorway to the rest of the website pages.**

(a) search engine (b) home page

(c) browser (d) URL (e) None of these

**84. Input, output and processing device grouped together represent a (n)………..**

(a) Mobile device

(b) information processing cycle

(c) circuit boards

(d) computer system

(e) None of the above

**85. Which of the following is not true about computer files?**

(a) they are collections of data saved to a storage medium

(b) Every file has a file name

(c) a file extension is established by the user to indicate the file’s contents

(d) files usually contain data

(e) None of the above

**86. The………… is the box that houses the most important parts of a computer system.**

(a) software (b) hardware

(c) input device (d) system unit

(e) None of these

**87. What type of computer could be found in a digital watch?**

(a) mainframe computer

(b) super computer

(c) embedded computer

(d) not book computer

(e) micro computer

**88. All of the following are example of real security and privacy risks EXCEPT**

(a) hackers (b) spam

(c) viruses (d) identity theft

(e) None of these

**89. This process is used by large retailers to study trends.**

(a) data mining (b) data selection

(c) POS (d) data conversion (e) None of these

**90. These terminals (formerly known as cash registers) are often connected to complex inventory and sales computer systems**

(a) Data

(b) Point-of-sale(POS)

(c) sales (d) Query

(e) None of these

**91. This system is a small, wireless handheld computer that scans an items tag and pulls up the current price (and any special offers) as you shop.**

(a) PSS (b) POS

(c) inventory (d) data mining

(e) None of these

**92. The ability to recover and read deleted or damaged files from a criminals computer is an example of a law enforcement specialty called**

(a) robotics (b) simulation

(c) computer forensics animation

(e) None of these

**93. Which of the following is NOT one of the four major data processing functions of a computer?**

(a) gathering data

(b) processing data into information

(c) analyzing the data or information

(d) storing the data or information

(e) None of the above

**94. This tags, when placed on an animal, can be used to record and track in a database all of the animals movement**

(a) POS (b) RFID

(c) PPS (d) GPS

(e) None of these

**95. Surgeons can perform delicate operation by manipulating devices through computers instead of manual. This technology is known as**

(a) robotics

(b) computer forensics

(c) simulation (c) forecasting

(e) None of these

**96. Technology no longer protected by copyright, available to everyone, is considered to be**

(a) proprietary (b) open

(c) experimental

(d) in the public domain (e) None of these

**97. It is the study of molecules and structures whose size ranges from 1 to 100 nanometers**

(a) Nanoscience (b) Microelectrodes

(c) Computer forensics

(d) artificial intelligence

(e) None of these

**98. It is the science that attempts to produce machines that display the same type of intelligence that humans do**

(a) Nanoscience (b) Nanotechnology

(c) Simulation

(d) Artificial intelligence (AI)

(e) None of these

**99. Which type of data has been organized or presented in a meaningful fashion?**

(a) A process (b) Software

(c) Storage (d) Information

(e) None of these

**100. The name for the way that computers manipulate data into information is called**

(a) programming (b) processing

(d) storing (d) organizing

(e) None of these

**MULTIPLE CHOICE QUESTIONS**

**1. Which of the following does not describe one or more characteristics of a computer?**

(a) electronic (b) external storage

(c) stored program

(d) program modification at execution

(e) all of the above are characteristics

**2. The CPU (Central processing unit) consists of:**

(a) input, output , and processing

(b) control unit, primary storage and secondary storage

(c) control unit, arithmetic-logic unit, and primary storage

(d) input, processing, and storage

(e) none of the above

**3. Which of the following is not an advantage of stored programs?**

(a) reliability

(b) reduction in operational costs

(c) ability of the computer to operate at electronic speeds

(d) the computers becoming general-purpose

(e) all of the above are advantages

**4. all of the following are examples of input devices except:**

(a) COM (Computer Output microform)

(b) CTR (Cathode Ray Tube)

(c) optical scanners

(d) voice-recognition devices

(e) all of the above are input devices

**5. Which of the following is not true of primary storage?**

(a) It is a part of the CPU

(b) It allows very fast access to data

(c) It is relatively more expensive

(d) Information must be transferred to primary storage

(e) All of the above are true.

**6. What is the control unit’s function in the CPU**

(a) to decode program instructions

(b) to transfer data to primary storage

(c) to perform logical operations

(d) to store program instructions

(e) none of the above

**7. The ascending order of a data hierarchy is:**

(a) bit-byte-record-field-file-database

(b) byte- bit- field-record- file-database

(c) bit-byte-record-file- field-database

(d) bit-byte- field-record-file-database

(e) none of the above

**8. Which of the following is not true of immediate processing?**

(a) It is often used in real-time applications

(b) It can occur with either sequential or direct-access files

(c) It can be used in a airline-reservation system

(d) Transactions are processed shortly after a real-world event event occurs

(e) all of the above are true

**9. Electronic spreadsheets are most useful in a situation where relatively………………data must be input, and (but)……….calculations**

(a) little; simple (b) large; simple

(c) large; complex (d) little; complex

**10. Which of the following statements is true?**

(a) the smart approach to using computer is to write programs.

(b) Knowledge of the system development life-cycle is not important to operators who use computers without programming

(c) Hand-on exposure to the computer is not helpful to those who write programs

(d) Personal computers have even an important contributing factor in the movement toward using computers without programming

(e) None of the above is true

**11. ……………is the product of data processing.**

(a) data (b) information

(c) software (d) a computer

(e) None of the above

**12. the most common input device use today is the ……………..**

(a) motherboard

(b) central processing unit

(c) keyboard (d) system unit

(e) semiconductor

**13. Software instructions intended to satisfy a user’s specific processing need are called………**

(a) System software (b) a microcomputer

(c) documentation

(d) applications software

(e) None of the above

**14. Which of the following is not a factor when categorizing a compute?**

(a) amount of main memory the CPU can use

(b) capacity of the storage devices

(d) cost of the system

(d) where it was purchased

(e) speed of the output device

**15. Which of the following is the most powerful type of computer?**

(a) Super micro (b) superconductor

(c) microcomputer (d) supercomputer

(e) mega fame

**16. Which of the following is related to monitor?**

(a) screen

(b) monochrome monitor

(c) RGB monitor (d) video display

(e) all of the above

**17. Which kind of storage device can be carried around?**

(a) hard disk (b) system cabinet

(c) diskette (d) main memory

(e) motherboard

**18. Which of the following people probably has the least amount of technical knowledge?**

(a) programmer (b) user

(d) systems analyst

(d) computer operator

(e) computer professional

**19. Which of the following device allows the user to add components and capabilities to a computer system?**

(a) storage devices (b) keyboards

(c) system boards (d) main memory

(e) motherboard

**20. Which of the following terms applies to communication between separate computer system?**

(a) computer literacy

(b) power supply

(c) supplications software

(d) connectivity

(e) none of the above

**21. people typically interface with a computer based system when?**

(a) information must be output

(b) data must be input

(c) information must be reviewed

(d) the compute needs a direction (or instruction) in order to process data

(e) all of the above

**22. The following typically happens in the output phase of a computer-based information system?**

(a) Data is put into the computer for processing

(b) Information is produced in hardcopy and/ or softcopy form

(c) Mathematical calculations are performed

(d) The computer is turned off

(e) all of the above

**23. Which of the following best describes a computer-based information system?**

(a) a system in which a computer is used to turn data into information

(b) in pulling data

(c) processing data

(d) performing complex mathematical calculations

(e) data is put into the computer for processing

**24. Which of the following pieces of hardware is used the most in the input phase of a computer-based information system?**

(a) classifying

(b) summarizing

(c) performing calculations

(d) sorting

(e) all of the above

**25. Which of the following attempts best describes the batch method of input?**

(a) printer (b) diskette

(c) monitor (d) keyboard

(e) main memory

**26. Which of the following statements best describes the batch method of input?**

(a) data is processed as soon as it is input

(b) data is input at the time it is collected

(c) data is collected in the form of source documents, placed into groups, and then input to the computer .

(d) sauce documents aren’t used

(e) none of the above

**27. Which of the following might occur when an organization uses on-line processing?**

(a) data is acted on immediately

(b) master files are updated immediately

(c) output is produced without delay

(d) all related files are updated

(e) all of the above

**28. The principle advantage of the centralize approach to organizing a computer facility is ?**

(a) cost-effectiveness

(b) processing activities are easier to coordinate

(c) processing activities greasier to control

(d) processing standards can be enforced

(e) all of the above

**29. Which of the following isn’t a type of compute facility?**

(a) decentralized (b) centralized

(c) de-distributed (d) distributed

(e) none of the above

**30. Which of the following isn’t used in the storage phase of a computer-based information system?**

(a) it requires much technical knowledge

(b) it requires large investments

(c) specialists in data system cannot be integrated into a marketing organization

(d) an integrated database accessible to all requires independent management

(e) none of the above

**32. To be information, data must be?**

(a) factual (d) relevant

(c) news (d) all of the above

(e) none of the above

**33. A teleprocessing system may be a?**

(a) computer system

(b) data communication system

(c) card processing system

(d) all of the above

(e) none of the above

**34. Data management systems may be implemented as**

(a) System software

(b) application software

(c) computer programs

(d) all of the above

(e) none of the above

**35. A data system for calculating measures used in statistical inference is an example of a?**

(a) teleprocessing system

(b) data management system

(c) computing system

(d) all of the above

(e) none of the above

**36. Strategic planning is**

(a) planning operations

(b) supervising

(c) problem identification

(d) all of the above

(e) none of the above

**37. An example of providing supervisory information by the use of teleprocessing technique is.**

(a) use of a computer to prepare customer invoice

(b) use of a computer to control a machine

(c) use of phone system to report job status

(d) all of the above

(e) none of the above

**38. As example of providing supervisory information by the use of computing system is**

(a) use of computer to prepare customer involve

(b) use of computer to plan shapes to be cut from sheet of steel

(c) use of phone to report job status

(d) all of the above

(e) none of the above

**39. For the purposes of defining data needs, a responsibility are is**

(a) marketing (b) administration

(c) personnel (d) all of the above

(e) none of the above

**40. Data systems for planning are often called**

(a) decision analysis systems

(b) planning analysis systems

(c) decision support systems

(d) all of the above

(e) none of the above

**41. Computing systems can be effective on generating strategic information because**

(a) they require managers to clarify their thinking about their plans and future possibilities

(b) they give management access to a large database

(c) all of the above (e) none of the above

**42. Coded entries which are used to gain access to a computer system are called:**

(a) Entry codes (b) passwords

(c) Security commands

(d) Codeword’s

**43. Electronic images of people speaking that are used in computer security operations are security operations are referred to as:**

(a) Voiceprints

(b) password images

(c) vocal passwords

(d) electronic prints

**44. A factor which might cause an individual to consider using a computer in criminal activates is**

(a) The computer’s access to large sums of money

(b) The speed with which the crime can be accomplished

(c) EFTS (Electronic Funds Transfer System)

(d) All the above

**45. The repeated access of a particular flight number form an airline reservation system is an example of:**

(a) Frequency

(b) Repetitive processing

(c) Updating

(d) Volume

**46. A factor which would strongly influence a business-person to adopt a computer is its:**

(a) Accuracy (b) Reliability

(c) Speed (d) All of the above

**47. The total number of messages handled by a computerized telephone system on a daily basis is an example of:**

(a) Frequency (b) Updating

(c) Volume (d) All of the above

**48. Which of the following statements is true?**

(a) The installation of a computer is favorably received by all employees

(b) Some form of training is necessary for employees who will work with computers

(c) computers are protected solely as socket’s benefactor

(d) a businessperson is only interested in the computer’s accuracy

**49. The average cost of computerized theft is estimated at:**

(a) $20,000 (b) $100,000

(c) $500,000 (d) $1,000,000

**50. The status of all data handled by a DP center is determined by a:**

(a) Data number (b) Control number

(c) Reference number (d) Item number

**51. The individual within the operations group who ordinarily uses a variety of keyboard device is the**

(a) Data clerk

(b) Keypunch operator

(c) Data entry clerk

(d) Computer operator

**52. The daily processing of corrections to customer accounts best exemplifies the processing mode of**

(a) Batch processing

(b) Real-time processing

(c) Real-time processing

(d) offline processing

**53. Which of the following terms could be used to describe the concurrent processing of computer programs, via CRTs, on one computer system?**

(a) Time-sharing

(b) Online processing

(c) Interactive processing

(d) All the above processing

**54. The unit of hardware an operator uses to monitor computer processing is the**

(a) Care reader (b) CPU

(c) Line printer (d) console

**55. The individual who catalogs storage media is the:**

(a) Data clerk (b) Control clerk

(b) Tape librarian (d) All the above

**56. The data processing job expected to further decrease in the 1990’s is that of**

(a) Keypuncher

(b) Data entry clerk

(d) Computer operator

(d) Programmer

**57. Which of the following statement is true?**

(a) Analysts usually work along and sometimes as part of a team

(b) Most systems projects are completed in 6 to 12 weeks

(c) An analyst’s primary concern is the development of software

(d) Analysts evaluated data flow through an organization

**58. The compute device primarily used to provide hardcopy is the**

(a) CRT (b) Line printer

(c) Computer console (d) Card reader

**59. The term interchangeable with control clerk is:**

(a) Data clerk

(b) Data control Clerk

(d) Tape librarian

(d) Data entry clerk

**60. In computer terminology, information mean**

(a) raw data

(b) data in more useful of intelligible form

(c) alphanumeric data

(d) program

**61. Data processing is**

(a) the same thing as data collection

(b) similar to computer programming

(c) mostly associated with commercial work

(d) akin to data coding

**62. Which one of the following can read data and convert them to a form that a computer can use?**

(a) Logic (b) Storage

(c) Controlee (d) input device

**63. Which one of the following can produce the final product of machine processing in a form usable by human?**

(a) Logic (b) Storage

(c) Controlee (d) input device

(e) Output device

**64. The term “memory” applies to which one of the following?**

(a) Logic (b) Storage

(c) Control (d) input device

(e) Output device

**65. List of detailed instructions that directs a computer is called which one of the following:**

(a) Logic (b) Storage

(c) memory (d) Program

(d) Programmer

**66. A computer program consists of ?**

(a) a completed flowchart

(b) algorithms

(d) algorithms written n computer’s language

(d) discrete logical steps

**67. In computer terminology a compiler means?**

(a) a person who computer source programs

(b) One same thing as a programmer

(c) key punch operator

(d) a program which translates source program into object program

**68. A source program is the program written in……language.**

(a) English (b) Symbolic

(c) high-level (d) machine

**69. A programmer written in machine language is called…………program.**

(a) assembler (b) object

(c) computer (d) machine

**70. A computer programmer**

(a) does all the thinking for a computer

(b) can enter input data quickly

(c) can operate all types of computers equipment

(d) can draw only flowchart

**71. most of the errors blamed on computers are actually due to**

(a) Programming errors

(b) hardware fatigue

(c) defects in floppy disks

(d) data entry errors.

**72. An integrated circuit (IC) is**

(a) a complicated circuit

(b) an integrating device

(c) much costlier than a single transistor

(d) fabricated on a tiny silicon chip

**73. Whit is the most significant difference between a simple desk calculator and compute? Choose form the following. (Net that some of the following may not been be true).**

(a) The computer is an electronic machine while the desk calculator may or may not be electronic

(b) The computer is useful in business applications while the desk calculator is not

(c) The computer can prints results, while the desk calculator can only show it on a display

(d) The computer is controlled by a program stored in its memory while calculator require step-by-step manual control

(e) One has to know the method of calculation while using a calculator but a computer user and depend upon the computer to choose the method automatically

**74. A visual display unit or terminal (Which is right)?**

(a) is, by definition, a dump terminal

(b) can possess either graphic or alphanumeric capabilities, but not both

(c) must be located at the site of the CPU

(d) Is the most popular input device used today in direct-access processing?

**75. The languages in which computer program are usually written differ from e language that the compute directly ‘obeys’ or ‘understands’. Who performs the translations?**

(a) The card reader (b) The programmer

(c) The computer operator

(d) A computer program

(e) A special hardware translator

**76. The basic decompounds of a modern digital compute are:**

(a) central processor (b) input device

(c) output device (d) all of the above

**77. Arithmetic and Logical Unit (ALU) are called the ………… of a computer.**

(a) magnetic cores for secondary storage

(b) LIS chips

(c) magnetic tapes for primary memory

(d) more than 10,000 vacuum tubules

**79. A ADU is used as**

(a ) input device

(b) output device

(c) voice data entry device

(d) both a and b

**80. Computer memory**

(a) performs all calculations

(b) receives input data

(c) is extremely limited

(d) is better than human memory

**81. The central processor of a modern digital computer consists of**

(a) control unit (b) primary memory

(c) all of the above

**82. Control unit is often called the. Of a digital computer,**

(a) nerve center

(b) master dispatched

(c)) clock

(d) all of the above

**83. A CPU’s processing power is measured in:**

(a) IPS (b) CIPS (c) MIPS

(d) nano-seconds

**84. Which of the following is a part of the central processing Unit.**

(a) Keyboard (b) Pinter

(c) Tape

(d) Arithmetic Logic Unit

**85. A collection of eight bits is called:**

(a) byte (b) word

(c) record (d) file

**86. The retrieval of information from the computer is defined as:**

(a) Collection of data

(b) Data retrieval operations

(c) Output

(d) Data output collection

**87. A term associated with the comparison of processing speeds of different computer system**

(a) EFTS (b) MPG

(c) MIPS (d) CPS

**88. A computer enthusiast is**

(a) user friendly (b) A hacker

(c) a computerist.

**89. Which of the following require large computer memery?**

(a) Imaging (b) Graphics

(c) voice (d) All of the above

(e) None of the above

**90. What is the term which represents the use of links between information of all sorts whether text, traphics , video or audio-based?**

(a) Hypertext (b) Hypermedia

(c) HyperCard (d) WildCard

**91. What hardware was used by first generation computers?**

(a) Transistors (b) IGs

(c) Values (d) ssi (e) VLSI

**92. Who observed, “future wars will start in the circuits of computers rather than in the minds of main”?**

(a) Joseph Weizenbaum

(b) General Alexander Haig

(c) Arthur C. Clarke

(d) Duncen Camphell

**93. General purpose computers are those that can be adopted to countless used simply by changing its**

(a) Keyboard (b) printer

(c) program (d) display screen

(d) none of the above

**94. The Santa Clara valley near Palo alto, California is popularly known as silicon valley of America because**

(a) huge deposits of silicon are found there

(b) many silicon chip manufacturing firms are located there

(c) Santa Clause visits it every Christmas

(d) it is full of large grain sand

**95. Processors of all computers, whether micro, mini or mainframe, must have**

(a) primary storage (b) ALU

(c) control unit (d) all of the above

(e) none of the above

**96. Modern computers are very reliable but they are not**

(a) fast (b) powerful

(c) infallible (d) cheap

**97. When did IBM close the last of its punched card manufacturing plant?**

(a) June, 1978 (b) December, 1984

(c) March, 1980 (d) November, 1981

**98. What is the mane of the ‘father’ of minicomputer and one of the founder fathers of the modern computer industry world-wide?**

(a) George Tat

(b) Kenneth H. Olsen

(c) Seymour Cray

(d) Hall Feeney

**100. When did the EISA consortium ‘Gang of Nine’ come into being in USA ?**

(a) 1988 (b) 1986

(c) 1984 (d) 1982

**101. Computers are incapable of emotional feelings. However, some people attribute humanlike emotions to inanimate objects including computers. What is it called?**

(a) Anthropogenesis

(b) Anthropomorphism

(c) Anthropolatory

(d) Cybernetics

**102. according to you, which of the following statement is in current?**

(a) Generally, computes don’t make mistakes

(b) Computers eliminate jobs

(c) Computers can think

(d) Math’s is necessary to understand

**103. From amongst the following, pick out the item that does not belong to computer.**

(a) Mouse (b) OCR

(c)MICR (d) Plotter

**104. Which one of the following words has both a common meaning and a computer meaning**

(a) Mode (b) Bus

(c) Quick (d) Efficiency

**105. A dumb terminal can do nothing more than communicate data to and from a CPU of a computer. How does a “smart” terminal differ from a dumb terminal?**

(a) It has a primary memory

(b) It has a cache memory

(c) It has a microprocessor

(d) It has an input device

**106. What is the name of the hardware and software package that is ready for use as soon as it is installed?**

(a) Hands-on system

(b) Quick implementations system

(c) Turnkey computer system

(d) Operational system

**107. In the past, microchip manufacturing has been a particular source of controversy between the U.S companies and the Japanese companies who have been charged with dumping microchips in the U.S. what it meant by the word “dumping”?**

(a) Selling cheaply

(b) Selling below cost

(c) Selling free

(d) Selling through agents

**108. It has been found that about 30 percent of the people feel ‘computer anxious’. Out of these, computer phobia. What is the technical name for this feeling of fear?**

(a) Comp phobia (b) Techno stress

(c) Cyber phobia (d) Dizziness

**109. People who enter data to computer through visual display terminals (VDTs) often suffer from eye strain and headaches due to poorly-lit monitors of develop muscle and joir. T problems due to poorly-designed workstations. What is the name of the subject which studies the user machine interface as it relates to physical comfort and ease of use?**

(a) office Automation

(b) User-friendliness

(c) Computer Stationery

(d) Ergonomics

**110. Fifth generation computers are likely to exhibit**

(a) artificial intelligence

(b) heuristic behavior

(c) advanced parallel processing

(d) all of the above

(e) none of the above

**111. Which of the following belongs to the first generation of computers?**

(a) ENIAC (b) UNIVAC

(c) IMB 8090 (d) IBM 1401

**112. The number of children in a family is a…..quantity.**

(a) analog (b) digital

(c) hybrid (d) hyperbolic

**114. If a computer is on but does not respond to a system reset, what is it said to be?**

(a) Dead (b) Off

(c) Hung (d) Insensitive

**115. A menu-driven operating system is one which allows you to pick up form the menu of choices it displays on the screen. What is the name given to the images which are used in such image oriented menus?**

(a) Icon (b) Figure

(c) Symbol (d) Model

**116. What is the name given to the weapons which use computerizes guidance system?**

(a) Guided weapons

(b) Smart weapons

(c) Dumb weapons

(d) Star wars weapons

**117. What was the nick name of the computer used by Americans in 1952 for their H-bomb project**

(a) ENIAC (b) EDSAC

(c) MANIAC (d) UNIVAC

**118. A computer has no more sense than a light**

(a) bulb (b) pen

(c) switch (d) pad

**119. Who is credited with the idea of using punch cards to control pattern ins weaving machine?**

(a) Pascal (b) Hollerith

(c) Babbage (d) Backquard

**120. One of the most impressive features of a modern digital computer is it speed. A fast computer is able to do more calculations in one minute than a person using a pencil and paper can do in**

(a) 0 years (b) 20 years

(c) Lifetime (d) 50 years

**121. Which of the following does not contain a microprocessor?**

(a) Robot (b) Microwave oven

(c) Washing maching (d) Ball pen

**122. What is meant by computer literacy?**

(a) Ability to write computer programs

(b) Known what a computer can and cannot be

(c) Knowing computer related vocabulary

(d) Ability to assemble computers

**123. What is a Jacquard loom?**

(a) A bird found in Bangalore

(b) A weaving machine which use punched card

(c) The first computer controlled loom

(d) A machine for writing match tables

**124. The first electronic general purpose digital computer built by Mauchly and Eckert called ENIAC did not work on the stored program principle. How many numbers could it store in its internal memory?**

(a) 100 (b) 20

(c) 500 (d) 1000

**125. The digital computer was developed primarily in:**

(a) USSR (b) Japan

(c) USA (d) UK

**126. The subject of Cybernetics deals with the science of**

(a) genetics

(b) control and communication

(c) molecular biology

(d) biochemistry

**127. The attribution of human from or qualities to things such as machines or computers is called**

(a) Cybernetics

(b) cybernation

(c) artificial intelligence

(d) anthropomorphism

**128. With the development of digital computer s, there has been an increasing study of the relationship among computers, the human nervous system and the human thinking process. The origin of this field of study is attributed to**

(a) Norbert Wiener (b) Marvin Minsky

(b) A.M. Turning (d) Arthur Clarke

**129. A novel technology based on semiconductor device called the Neuron company based Palo Alto, California. This technology will revolutionize day to day doors, setting clocks, heating and cooling homes and operating electronic gadgets, etc. what is the name of this technology?**

(a) Local Operating Networking (LON)

(b) Local Area Network (LAN)

(c) Value Added Network (VAN)

(d) Wide Area Network (WAN)

**130. The physical equipment made of various metals, silicon and plastic components that make up the parts of a computer is called**

(a) micro (b) peripheral

(c) hardware (d) disk driver

**131. The pieces of equipment which are attached to the CPU of a computer and which it can access are called**

(a) output device (b)control units

(c) peripherals (d) ALU

**132. A computer is a box full of electronic**

(a) chips

(b) switching devices

(c) circuits

(d) components

**133. The analog compute measures dimensions and its circuits use the differential and integral equations of continuous variables. The digital computer counts units and its circuits use**

(a) logic gates

(b) describe switches

(c) Boolean algebra

(d) Bayes’ theorem

**134. A ‘number crunching’ computer is one that can handle**

(a) large spreadsheets

(b) large alphanumeric data

(c) large volume of numbers

(d) only numbers

**135. In computer technology, what is meant by the phrase “state-of-the-art”?**

(a) Up-to-data (b) Best

(c) Latest (d) all of the above (e) None of the above

**136. Apple computer inc. was established in 1977 by a couple of yound computer engineers with the idea of manufacturing low price computers for the use of small businesses. Why did they call their company Apply?**

(a) because their computer resembled an apple in shape

(b) because the company was situated near an apple orchard

(c) because one of the partners had once worked in an apple orchard

(d) because the company was set up during apple season in America

**137. Though a compute can replace people in dull and routine tasks, yet it lacks**

(a) imitative (b) originality

(c) speed (d) accuracy

**138. The word ‘computer’ usually refers to the central processor units plus**

(a) keyboard

(b) external memory

(c) internal memory

(d) peripheral devices

**139. If a computer had n decision-making function, what will it be reduced to?**

(a) Electrical machine

(b) Adding machine

(c) Counting machine

(d) Slide rule

**140. A computer can only do what it is told to de but it does it at a very fast speed and with cent percent accuracy. Can you guess the Intelligence Quotient (IQ) of a modern digital computer?**

(a) 100 (b) 0 (c) 60 (d) 150

**141. An error in software or hardware is called a bug. What is the alternative computer jargon for it?**

(a) Leech (b) Squid

(c) Slug (d) Glitch

**142. No compute can do anything without a**

(a) program (b) memory

(c) chip (d) output device

**143. Human beings are referred to as Homosapiens. Which device is called silicon sapiens?**

(a) Monitor (b) hardware

(c) Robot (d) Computer

**144. What is the name of given to the molecular-scale computer?**

(a) Super computer (b) Nanocomputer

(c) Femtocomputer (d) Microcomputer

**145. A new technology which provides the ability to create an artificial word and have people interact with it is called**

(a) televirtuality (b) virtual reality

(c) alternative reality (d) 3-D reality

**146. Which of the following is not currently a topic in computer science?**

(a) Speech recognition

(b) Artificial intelligence

(c) Thermodynamics

(d) Multiprocessing

**147. In 1990, the US Department of Commerce permitted export of computers with a processing data rate (PDR) of 275 to India. Higher PDR rating means more powerful and versatile competing prowess. Which PDR is called the China Green Line?**

(a) 200 (b) 250 (c) 275 (d) 550

**148. “The three most important inventions of this century are the nuclear bomb, the high yield hybrid speed, and the computer”. Can you name the person who made this statement?**

(a) Harry F. Jordan

(b) Buckminster Fuller

(c) Jack Smith

(d) Jan Timmer

**149. Which generation of computers is covered by the period 1964-77?**

(a) First (b) Second

(c) Third (d) Fourth

**150. Scientists at the University of Edinburg, Scotland have devised to video camera-on-a-chip which consists of lenses smaller than match-head on an 8 mm chip. Can you name the two scientists who have developed this chip?**

(a) peter Tal (b) Peter Denyer

(c) David Renshaw (d) Both a and c

**151. In computer jargon, wetware means**

(a) human intelligence

(b) any organic intelligence

(c) artificial intelligence

(d) high intelligence

**152. Today’s computer giant IBM was earlier known by a different name which was changed in 1924. What was that name?**

(a) Tabulator Machine Co.

(b) Computer Tabulating Recording Co.

(c) The Tabulator Ltd

(d) Internaial Computer Ltd.

**153. In March 1991, Hannover in Germany hosted an outstanding exhibition of information technology converting computer software, office automation, personal computers, telecommunications, security equipment etc. along with C-technologies. What is meant by C-technologies.**

(a) CAD (b) CAM

(c) CIM (d) All of the above

**154. What is the name of modern film in which a computer manages to capture and impregnate a human woman?**

(a) The Day the Earth Stood Still

(b) forbidden Flanet

(c) Demon Seed

(d) The Invisible Boy

**155. Electronic industry has gained the reputation of being a “clean business” toxic substances, it was found by a certain company in 1986 that an abnormally high rate of miscarriages occurred among women on the company’s chip assembly line. What was the name of the company?**

(a) Digital Equipment Corporation (DEC)

(b) Hitachi Ltd

(c) Hewlett-Packard Co.

(d) Wang laboratories Inc

**156. When was the X window System born?**

(a) 1984 (b) 1986

(c) 1988 (d) 1990

**157. Where does a compute add, compare and shuffle its data?**

(a) Memory chip (b) CPU chip

(c) Floppy disk (d) Hard disk

**158. Which American compute company is called Big Blue**

(a) Microsoft Corpn. (b) Compaq Corpn

(c) IBM (d) Tandy Svenson

**159. Who launched IBM’s first P in 1981?**

(a) Dean Cline (b) C.B. Rogers Jr.

(c) John F. Akers (d) David Svenson

**160. The first IBM PC did not have any**

(a) disk drive (b) RAM

(C) ROM (d) Port

**161. When did arch rivals IBM and Apple computers Inc. decide to join hands?**

(a) 1988 (b) 1989 (c) 1990 (d) 1991

**162. When did IBM introduce the 80286-based AC/AT?**

(a) 1983 (b) 19834 (c) 1985 (d) 1987

**163. Smart Cable is a device used for connecting otherwise incompatible computers without using custom cables. This interface operator has beco9me a matter of legal dispute between two well-known American companies, one of which is Microsoft Corpn. Which is the other company?**

(a) IQ Technologies (IQT)

(b) Kansai International Inc.

(c) Fifth Generation Systems Inc.

(d) IBM Corpn.

**164. Who in 1988 announced the latest version of CD-ROM called CE-ROM XA (extended architecture) which provides a documented means of integrating digital audio with computer data on a CD-ROM disk?**

(a) Sony (b) Philips

(c) Microsoft (d) All of the above

**165. CD-TV is basically a PC without keyboard or floppy disk drive but with a remote control and a CD-ROM drive. Who has announced this system?**

(a) Commodore (b) Sony

(c) Philips (d) Toshiba

**166. Which of the following is true of the digital computer?**

(a) It represents the decimal numbers through a string of binary digits

(b) It is used primarily in scientific applications

(c) It is less accurate than the analog computer

(d) All of the Above

(e) None of these

**167. Which of the following is not true of primary storage?**

(a) It represents the decimal numbers through a string of binary digits

(b) It stores operating-system programs

(c) It stores data while they are being processed by the CPU

(d) It stores the bulk of data used by a computers applications

(e) all of the above are true

**168. Compared with secondary storage, primary storage is:**

(a) slow and inexpensive

(c) fast and inexpensive

(c) fast and expensive

(d) slow and expensive

**169. The CPU can perform read or write operation at any point in time in:**

(a) ROM (b) PROM

(c) EPROM (d) RAM

**170. The technique of placing software of programs in a ROM semiconductor chip is called?**

(a) PROM (b) EPROM

(c) Firmware (d) microprocessor

**171. The advantages of magnetic tape include all of the following except?**

(a) Low cost

(b) direct-access storage medium

(c) compact and portable

(d) highly reliable

(e) all of the above are advantages

**172. Currently the most popular form of secondary storage is?**

(a) magnetic tape (b) semiconductor

(c) magnetic core (d) mass storage

(e) disk

**173. Which of the following is an example of nonvolatile memory?**

(a) ROM (b) RAM

(c) LSI (d) VLSI

(e) none of the above

**174. ………can be programmed on e time by either the manufacturer or the computer user. Once programmed, it cannot be modified:**

(a) RAM (b) RAM

(c) PROM (d) EPROM

(e) None of the above

**175. Which of the following is not true of a magnetic disk?**

(a) Users can easily update records by writing over the old data

(b) It provides only sequential access to stored data

(c) It is expensive relative to magnetic tape

(d) It does not provide an automatic audit trail

(e) All of the above are true

**176. Which of the following is not true of purched cards as data-entry media?**

(a) They can be used as turn-around documents

(b) They are inexpensive

(c) Input is slow compared with other media

(d) They are easily damaged

(e) All of the above are true

**177. The primary advantage of key-to-tape data entry system is:**

(a) A large percentage of editing can be performed at the time of data entry

(b) Key verification is easily performed

(c) The tape is reusable

(d) Keying errors can be detected as they occur

(e) All of the above

**178. Linkage between the CPU and the users is provided by:**

(a) peripheral devices

(b) storage

(c) control unit

(d) software

(e) all of the above

**179. Which of the following is widely used in academic testing?**

(a) MICR (b) POS (c) OCR (d) OMR (e) CRT

**180. The……. Is a nonimpact printer that can produced every high quality, letter-perfect printing.**

(a) dot-matrix printer

(b) daisy-wheel printer

(c) electrostatic printer

(d) laser printer

(e) none of the above

**181. The POS data-entry system is used most extensively by the:**

(a) baking industry (b) grocery industry

(c) railroad industry (d) word-processing industry (e) None of the above

**182. A disadvantage of the laser printer is:**

(a) it is quieter than an impact printer

(b) it is very slow

(c) the output is of a lower quality

(d) it cannot produce a wide range of type fonts

(e) none of these

**183. Data entry can be performed with all of the flowing except:**

(a) OCR (b) OMR

(c) COM

(d) Voice-recognition system

(e) MICR

**184. Magnetic tape can serve as:**

(a) input media (b) output media

(c) secondary-storage media

(d) a and b only (e) b and only

(f) all of the above

**185. The advantage of COM are its………… and ………**

(a) compact size, readability

(b) compact size, speed

(c) readability; speed

(d) low-cost; readability

(e) compact size, low cost

**186. EBCDI can code up to how many different characters?**

(a) 8 (b) 16 (c) 32 (d) 64

(e) 256

**187. The hexadecimal number system has a base of:**

(a) 2 (b) 4 (c) 8 (d) 10

(e) 16

**188. The parity bit is added for……..purposes**

(a) coding (b) indexing

(c) error-detection (d) controlling

(e) updating

**189. Which of the following fields in a student file can be used as a primary key?**

(a) class (b) social security number

(c) GPA (d) major

(e) all of the above

**190. The two basic types of record- access methods are:**

(a) sequential and random

(b) direct and immediate

(c) sequential and indexed

(d) on- line and real time

(e)none of the above

**191. which file organization is allowed by a direct- access storage device?**

(a) direct only

(b) sequential and direct only

(c) indexed and direct only

(d) sequential, indexed and direct.

**192. Sequential file organization is most appropriate for which of the following applications?**

(a) grocery- store checkout

(b) bank checking accounts

(c) payroll

(d) airline reservations

(e) none of the above

**193. which of the following is not a practical data- processing approach?**

(a) batch- sequential (b) batch direct

(c) immediate- sequential

(d) immediate- direct

(e) all of the above are proper approaches

**194. Which of the following file organization is most efficient for a file with a high degree of file activity?**

(a) Sequential (b) ISAM

(c) VSAM (d) B- tree index

(e) all of the above

**195. Which of the following is not one of the three primary functions that on- line direct- access systems can serve?**

(a) inquiry (b) backup

(c) update (d) programming

**196. Which of the following is considered a direct- entry input device?**

(a) optical scanner (b) mouse

(c) light pen (d) digitizer

(e) all of the above

**197. Which of the following types of input media is used much less now than in 1960s?**

(a) Hard disc (b) punched cards

(c) Magnetic tapes (d) Floppy disk

(e) All of the above

**198. which of the following is required when more than one person uses a central computer at the same time?**

(a) Terminal (b) light- pen

(c) digitizer (d) mouse

(e) none of the above

**199. Which of the following typically uses a keyboard for input?**

(a) Desktop terminal

(b) point of sale terminal

(c) financial transaction terminal

(d) executive workstation

(e) All of the above

**200. Which of the following types of terminals is entirely dependent for all its capabilities on the computer system to which it is connected?**

(a) smart terminal (b) dumb terminal

(c) microcomputer

(d) intelligent terminal

(e) none of the above

**201. Which of the following is an advantage of magnetic input media|?**

(a) High speed

(b) flexibility in accessing data

(c) low cost

(d) Reusability

(e) All of the above

**202. Which of the following is used only for data entry and storage, and never for processing?**

(a) mouse (b) dumb terminal

(c) microcomputer

(d) dedicated data entry system

(e) All of the above

**203. Which of the following is not a direct entry Input device?**

(a) keyboards (b) light pens

(c) digitizers (d) Input controls

(e) none of the above

**204. Which of the following is not a direct entry input device?**

(a) keyboards (b) light pens

(c) digitizers (d) optical controls

(e) none of the above

**205. Which of the following would you most likely use at home as well as in the office connected to a central computer?**

(a) dump terminal

(b) point-to-sale terminal

(c) financial transaction terminal

(d) microcomputer

(e) mainframe computer

**206. Which of the following is a unit of measurement used with computer systems?**

(a) byte (b) megabyte

(c) gigabyte (d) kilobyte

(e) all of the above

**207. Why do so many microcomputers today hard disks?**

(a) can be moved easily form one computer to another

(b) inexpensive

(c) very high storage capacity

(d) they are a sequential access storage device

(e) all of the above

**208. Hard disk and diskettes are:**

(a) sequential access storage devices

(b) direct access storage devices

(c) rarely used with microcomputers

(d) capable of storing terabytes of data and information

(e) all of the above

**209. Which of the following terms isn’t used to refer to the recording density of a disk?**

(a) mega-density (b) single-density

(c) double- density (d) quad- density

(e) none of the above

**210. Which of the following is the most appropriate unit for measuring the storage capacity of a hard disk?**

(a) byte (b) megabyte

(c) bit (d) terabyte

(e) none of the above

**211. Which of the following statement is false?**

(a) Secondary storage is nonvolatile

(b) Primary storage is volatile

(c) Secondary storage contains data for immediate processing

(d) When the computer is turned off, data and instructions stored in primary storage are erased

(e) all of the above

**212. Which of the following storage and retrieval methods would be well suited to your processing requirements if you only need to retrieve records one at a time and there is no fixed pattern to the requests for data and records?**

**213. Which of the following is not used for storage purposes with mainframe computers?**

(a) removable disks

(b) fixed disk

(c) mass storage systems (d) diskettes

(e) none of the above

**214. Which of the following factors would you disregard when determining the storage capacity of a hard disk?**

(a) track density

(b) height of the hard disk drive

(c) recording density

(d) number of platters

(e) none of the above

**215. Which of the following is true?**

(a) Fields are composed of bytes

(b) Fields are composed of records

(c) Fields are composed of characters

(d) Records are composed of fields

(e) all of the above

**216. Which of the following holds data and processing instructions temporarily until the CPU needs it?**

(a) ROM (b) control unit

(c) main memory

(d) coprocessor chips

(e) none of the above

**217. Which of the following are the two main components of the CPU?**

(a) control unit and registers

(b) registers and main memory

(c) control unit and ALU

(d) ALU and bus (e) none of the above

**218. Which of the following is used for manufacturing chips?**

(a) control bus (b) control unit

(c) parity unit (d) semiconductors

(e) none of the above

**219. Which of the following is the most characteristic of ROM?**

(a) it is measured in megabytes

(b) it is volatile

(c) It performs mathematical calculations

(d) Instructions are stored the permanently

(e) none of the above

**220. Which of the following hardware components is the most volatile?**

(a) ROM (b) RAM

(c) PROM (d) EPROM

(e) EEPROM

**221. Which of the following is used to check for errors in RAM chips?**

(a) ROM chip

(b) microprocessor chip

(c) parity

(d) EPROM chip

(e) none of the above

**222. Which of the following are used to quickly accept, tore, and transfer data and instructions that are being used immediately by the CPU?**

(a) microprocessors (b) registers

(c) ROM chips (d) data buses

(e) none of the above

**223. Why is the width of a data but so important to the processing speed of a computer?**

(a) The narrower it is, the greater the computer’s processing speed

(b) The wider it is, the more data that can fit into main memory

(c) The wider it is, the greater the computer’s processing speed

(d) The wider it is, the slower the computer’s processing speed

(e) The data bus isn’t important to the processing speed of a computer

**224. Which of the following terms is the most closely related to main memory?**

(a) nonvolatile (b) permanent

(c) control unit (d) temporary

(e) none of the above

**225. Which of the following affects processing power?**

(a) data bus capacity

(b) addressing scheme

(c) clock speed

(d) register size

(e) all of the above

**226. Which of the following is used to insure the high quality of computer output?**

(a) voice output system

(b) output controls

(c) computer output microfilm

(d) liquid crystal display

(e) none of the above

**227. Which of the following technologies will you likely see in laptop computers?**

(a) voice output system

(b) output controls

(c) computer output microfilm

(d) liquid crystal display

(e) none of the above

**228. Which of the following is the principal difference between a mono-chrome monitor and an RGB monitor?**

(a) number of electron guns

(b) resolutions

(c) size

(d) cost

(e) all of the above

**229. Which of the following can be output by a computer?**

(a) graphics

(b) voice

(c) text

(d) Computer-usable data or information

(e) all of the above

**230. Output hardware is often categorized according to whether it?**

(a) is expensive

(b) requires a large amount of electricity to work

(c) produces hardcopy or softcopy

(e) can fit on a desktop

(e) None of the above

**231.Large computer systems typically used:**

(a) dot-matrix printers

(b) daisy wheel printers

(c) ink-jet printers

(d) line printers

(e) all of the above

**232. Which of the following printers, are you sure will not to use if your objective is to print on multi carbon forms?**

(a) daisy wheel (b) dot-matrix

(c) laser (d) thimble (e) all of the above

**233. Which of the following isn’t part of CRT?**

(a) phosphor (b) shadow mask

(c) electron gun (d) gas plasma

(e) none of the above

**234. Which of the following does not affect the resolution of a video display image?**

(a) bandwidth

(b) raster scan rat

(c) vertical and horizontal

(d) screen size

(e) all of the above

**235. To produce high-quality graphics (hardcopy) in color, you would want to use a (n)**

(a) RGB monitor (b) plotter

(c) ink-jet printer (d) laser printer

(e) all of the above

**236. The terminal device that functions as a cash register, computer terminal, and COR reader is the:**

(a) video display terminal

(b) COR register terminal

(c) data collection terminal

(d) POS terminal

**237. The technique designed to support the effective access of micro-filmed data is:**

(a) Microfiche retrieval

(b) COM

(c) micrographics

(d) All of the above

**238. An impact printer that uses an interchangeable, rotating printing unit for hard copy output is the:**

(a) thermal printer

(b) wire-matrix printer

(c) drum printer

(d) daisy-wheel printer

**239. Which of the following printing devices provides an output composed of a series of dots?**

(a) Wire-matrix printer

(b) band printer

(c) WANG image printer

(d) a or c

**240. Which of the following terminal’s output most closely resembles the output produced by a plotter?**

(a) graphics terminal (b) POS terminal

(c) hardcopy terminal (d) all the above

**241. Which of the following impact printers print fastest?**

(a) band printer

(b) chain printer

(c) drum printer

(d) write-matrix printer

**242. Which of the following statement is true?**

(a) all hardcopy terminals use punched paper tapes.

(b) Intelligent terminals provide hardcopy output only.

(c) Microfiche are always produced directly from printed outputs.

(d) None of the above

**243. Softcopy outputs available from the IMB 3279 Color Display terminal may include:**

(a) graphic display of data

(b) three-dimensional line drawings

(c) line-by line outputs of character data

(d) all the above

**244. The terminal device often used in checking charge cards that offers both a limited keyboard input and visual output is the:**

(a) intelligent terminal

(b) OPS terminal

(c) video display terminal

(d) audio response unit

**245. Which of the following printing devices can generate printed outputs composed of two or more types of printed characters?**

(a) IBM 3800 printing Subsystem

(b) Twin-head daisy-wheel printer

(c) WANG image Printer

(d) All of the above

**246. The computer code for the interchange of information between terminals is:**

(a) ASCII (b) BCD

(c) EBCDIC (d) HOLLERITH

**247. A temporary storage area, attached to the CPU, for I/O operations is a:**

(a) channel (b) buffer

(c) register (d) core

**248. In virtual storage, program segments stored on disk during processing are called:**

(a) sections (b) partitions

(c) pages (d) sectors

**249. The EBCDIC code for the character X, with odd parity, is:**

(a) 0 1110 0110 (b) 1 1110 0111

(c) 1 1110 0110 (d) 0 1110 0111

**250. A characteristic of the ASCII code is:**

(a) it limitation to a maximum of 96 character configurations

(b) its use of the zone code 1010, 1011 and 1100

(c) its independence from the Hollerith code

(d) all the above

**251. The comparison of data inside the arithmetic logic unit is referred to as a:**

(a) question

(b) data operation

(c) conditional question

(d) all the above

**252. The ASCII code for the character J is:**

(a) 1101 0001 (b) 1101 1010

(c) 1010 1010 (d) 1010 0001

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | B | 2 | C | 3 | B | 4 | A |
| 5 | E | 5 | A | 7 | D | 8 | B |
| 9 | d | 10 | d | 11 | D | 12 | C |
| 13 | D | 14 | D | 15 | D | 16 | D |
| 17 | C | 18 | B | 19 | E | 20 | D |
| 21 | E | 22 | B | 23 | A | 24 | E |
| 25 | D | 26 | C | 27 | B | 28 | E |
| 29 | C | 30 | B | 31 | D | 32 | D |
| 33 | D | 34 | D | 35 | C | 36 | C |
| 37 | C | 38 | B | 39 | C | 40 | C |
| 41 | B | 42 | B | 43 | A | 44 | D |
| 45 | A | 46 | D | 47 | C | 48 | B |
| 49 | C | 50 | B | 51 | C | 52 | A |
| 53 | D | 54 | D | 55 | C | 56 | A |
| 57 | D | 58 | B | 59 | A | 60 | B |
| 61 | C | 62 | B | 63 | E | 64 | B |
| 65 | B | 66 | C | 67 | D | 68 | C |
| 69 | B | 70 | A | 71 | D | 72 | D |
| 73 | D | 74 | D | 75 | D | 76 | D |
| 77 | A | 78 | B | 79 | B | 80 | C |
| 81 | C | 82 | A | 83 | C | 84 | D |
| 85 | A | 86 | C | 87 | C | 88 | B |
| 89 | B | 90 | B | 91 | C | 92 | C |
| 93 | C | 94 | B | 95 | D | 96 | C |
| 97 | B | 98 | B | 99 | B | 100 | A |
| 101 | A | 102 | C | 103 | D | 104 | B |
| 105 | C | 106 | C | 107 | B | 108 | C |
| 109 | D | 110 | D | 111 | B | 112 | B |
| 113 | A | 114 | C | 115 | A | 116 | B |
| 117 | C | 118 | C | 119 | D | 120 | C |
| 121 | D | 122 | B | 123 | B | 124 | B |
| 125 | C | 126 | B | 127 | D | 128 | A |
| 129 | A | 130 | C | 131 | C | 132 | B |
| 133 | C | 134 | C | 135 | D | 136 | C |
| 137 | B | 138 | C | 139 | B | 140 | B |
| 141 | D | 142 | A | 143 | D | 144 | B |
| 145 | B | 146 | C | 147 | D | 148 | D |
| 149 | C | 150 | D | 151 | B | 152 | B |
| 153 | D | 154 | C | 155 | A | 156 | A |
| 157 | B | 158 | C | 159 | B | 160 | A |
| 161 | B | 162 | B | 163 | A | 164 | D |
| 165 | A | 166 | A | 167 | D | 168 | C |
| 169 | D | 170 | C | 171 | B | 172 | E |
| 173 | A | 174 | C | 175 | B | 176 | B |
| 177 | C | 178 | A | 179 | D | 180 | D |
| 181 | B | 182 | E | 183 | C | 184 | F |
| 185 | B | 186 | B | 187 | E | 188 | C |
| 189 | A | 190 | A | 191 | D | 192 | C |
| 193 | C | 194 | A | 195 | B | 196 | E |
| 197 | B | 198 | A | 199 | E | 200 | B |
| 201 | E | 202 | A | 203 | D | 204 | E |
| 205 | D | 206 | E | 207 | C | 208 | B |
| 209 | A | 210 | B | 211 | C | 212 | D |
| 213 | D | 214 | B | 215 | E | 216 | C |
| 217 | C | 218 | D | 219 | D | 220 | B |
| 221 | C | 222 | B | 223 | C | 224 | D |
| 225 | E | 226 | B | 227 | D | 228 | A |
| 229 | E | 230 | C | 231 | D | 232 | C |
| 233 | B | 234 | D | 235 | D | 236 | D |
| 237 | C | 238 | D | 239 | D | 240 | A |
| 241 | B | 242 | D | 243 | D | 244 | C |
| 245 | D | 246 | A | 247 | B | 248 | C |
| 249 | B | 250 | C | 251 | D | 252 | c |

**COMPUTER SCIENCE FUNDAMENTALS**

**1. The most common input device used today is the**

(a) Motherboard

(b) central processing unit

(c) keyboard

(d) system unit

**2. coded entries which are used to gain access to a computer system are called**

(a) Entry codes

(b) Passwords

(c) Security commands

(d) Code words

**3. If a computer is on but does not respond to a system reset, what is it said to be?**

(a) Dead (b) off

(c) Hung (d) Insensitive

**4. Which of the following is the most characteristic of ROM?**

(a) It is measured in megabytes

(b) It is volatile

(c) It performs mathematical calculations

(d) Instructions are stored there permanently

**5. Main memory contains?**

(a) Data (b) Instructions

(c) Both a and b (d) Neither a nor b

**6. Which of the following does not describe one or more characteristics of a computer?**

(a) Electronic (b) External storage

(c) Stored program

(d) Program modification at execution

**7. Computing system can be effective in generating strategic information because**

(a) The future can be predicted form the pattern of the past

(b) They require managers o clarify their thinking about their plans and future possibilities

(c) They give management access to a large database

(d) All of the above

**8. A dumb terminal can do nothing more than communicate data to and from a CPU of a computer. How does a ‘smart’ terminal differ from a dumb terminal?**

(a) It has a primary memory

(b) It has a cache memory

(c) It has a microprocessor

(d) It has an input device

**9. An impact printer that uses an interchangeable, rotating printing unit for hard copy output is the**

(a) Thermal printer

(b) Wire-matrix printer

(c) Drum printer

(d) Daisywheel printer

**10. To produce high-quality graphics (hard copy) in color, you would want to use a(n)**

(a) RGB monitor (b) plotter

(c) ink-jet printer (d) Laser printer

**11. The CPU (Central Processing Unit) consists of**

(a) Input, output, and processing

(b) Control unit, primary storage, and secondary storage

(c) Control unit, arithmetic-logic unit, and primary storage

(d) Input, processing, and storage

**12. For the purposes of defining data needs, a responsibility area is**

(a) Marketing (b) Administration

(c) Personnel (b) All of the above

**13. It has been found that about 30 percent of the people feel ‘computer anxious’. Out of these, about 3 to 5 percent suffer from serious computer phobia, what is the technical name for this feeling of fear?**

(a) Comp phobia (b) Techno stress

(c) Cyber phobia (d) Dizziness

**14. The terminal device that functions as a cash register, computer terminal, and COR reader is the**

(a) Video display terminal

(b) OCR register terminal

(c) Data collection terminal

(d) POS terminal

**15. Which of the following is not an advantage of stored programs?**

(a) Reliability

(b) Reduction in operational costs

(c) Ability of the computer to operate at electronic speeds

(d) The computers becoming general purpose

**16. Data systems for planning are often called**

(a) Decision analysis systems

(b) Planning analysis systems

(c) Decision support systems

(d) All of the above

(e) None of these

**17. From amongst the following, pick out the item that does not belong to computer**

(a) Mouse (b) OCR

(c) OCR (d) MICR

(e) Plotter

**18. Hard disk and diskettes are**

(a) Sequential access storage devices

(b) Direct access storage devices

(c) Rarely used with microcomputers

(d) Capable of storing terabytes of data and information

**19. Which of the following impact printer print fastest?**

(a) Band printer

(b) Chain printer

(c) Drum printer

(d) Wire-matrix printer

**20. All of the following are examples of input devices except**

(a) COM (Computer Output Micro film)

(b) CRT (Cathode Ray Tube)

(c) Optical scanners

(d) Mouse

**21. An example of providing supervisory information by the use of a computing system is**

(a) Use of computer to prepare customer invoices

(b) Use of computer to plan shapes to be cut from sheet of steel

(c) Use of phone to report job status

(d) All of the above

**22. Modern computers are very reliable but they are not**

(a) Fast (b) Powerful

(c) Infallible (d) Cheap

**23. Which are the three major components of a central processing unit?**

(a) Primary memory

(b) ALU

(c) Control unit

(d) All of the above

**24. The computer code for the interchange of information between terminals is**

(a) ASCII (b) BCD

(c) EBCDIC (d) HOLLERTH

**25. Which of the following is not true of primary storage?**

(a) It is a part of the CPU

(b) It allows very fast access to data

(c) It is relatively more expensive

(d) All of the above are true

**26. A teleprocessing system may be a**

(a) Computer system

(b) Data communication system

(c) Card processing System

(d) All of the above

**27. What is the name of the hardware and software package that is ready for use as soon as it is installed?**

(a) Hands-on system

(b) Quick implementation system

(c) Turnkey computer system

(d) Operational system

**28. A temporary storage area, attached to the CPU, for I/O operations is a**

(a) Channel (b) Buffer

(c) Register (d) Core

**29. Which of the following technologies will you likely see in laptop computers?**

(a) Voice output systems

(b) Output control

(c) Computer output microfilm

(d) Liquid crystal display

**30. The product of data processing is**

(a) Data (b) Information

(c) Software (d) A computer

**31. Electronic images of people speaking that are used in computer security operations are referred to as**

(a) Voiceprints

(b) Password images

(c) Vocal password

(d) Electronic prints

**32. Which one of the following words has both a common meaning and a computer meaning?**

(a) Mode (b) Bus

(c) Quick (d) Efficiency

**33. A Computer program that converts an entire program into machine language at one time is called a/ an**

(a) Interpreter (b) Simulator

(c) Compiler (d) Commander

**34. Electronic spreadsheets are most useful in a situation where relatively……..data must be input, and ……calculations are required**

(a) Little; simple (b) Large; simple

(c) Large; complex (d) Little; complex

**35. The total number of messages handled by a computerized telephone system on a daily basis is an example of**

(a) Frequency (b) Updating

(c) Volume (d) All the above

**36. According to you, which of the following statement is incorrect?**

(a) Generally, computers don’t make mistakes

(b) Computers eliminate jobs

(c) Computers can think

(d) Math’s is necessary to understand computers

**37. There is only one key in the keyboard of a computer which is without any marking and is also the widest key of the keyboard. What is the name of this key?**

(a) Shift key (b) Enter key

(c) Backspace key (d) Space

**38. Which computer memory is used for storing programs and data currently being processed by the CPU?**

(a) Mass memory

(b) Internal memory

(c) Nonvolatile memory

(d) PROM

**39. What is the control unit’s function in the CPU?**

(a) To decode program instructions

(b) To transfer data to primary storage

(c) To perform logical operations

(d) To store program instructions

**40. The repeated access of a particular flight number from an airline reservation system is an example of**

(a) Frequency

(b) Repetitive processing

(c) Updating

(d) Volume

**41. What hardware was used by first generation computer.**

(a) Transistors (b) ICs

(c) Valves (d) SSI

**42. The storage locations in the internal storage of a CPU are called**

(a) Contents (b) Addresses

(c) Locations (d) Intersections

**43. The computer memory used for temporary storage of data and program is called**

(a) ROM (b) Sector

(c) RAM (c) EPROM

**44. Which of the following statements is true?**

(a) The smart approach to using computers is to write programs

(b) Knowledge of the system development life-cycle is not important to operators who use computers without programming

(c) Hands-on exposure to the computer is not helpful to those who write programs

(d) Personal computers have been an important contributing factor in the movement toward using computers without programming

**45. Which of the following statements is true?**

(a) The installation of a computer is favorably received by all employees

(b) Some form of training is necessary for employees who will work with computers

(c) Computers are portrayed solely as society’s benefactor

(d) A business person is only interested in the computer’s accuracy

**46. What is the common method used by low megaflop computers for high speed data transmission?**

(a) Print spooling (b) Cycle stealing

(c) Looping (d) Multiplexing

**47. The technique of placing software or programs in a ROM semiconductor chip is called**

(a) PROM (b) EPROM

(c) Firmware (d) Microprocessor

**48. Software instructions intended to satisfy a user’s specific processing needs are called….**

(a) Systems software

(b) A Microcomputer

(c) Documentation

(d) Applications software

**49. A factor which might cause an individual to consider using a computer in criminal activities is**

(a) The computer’s access to large sums of money

(b) The speed with which the rime can be accomplished

(c) EFTS (Electronic Funds Transfer System)

(d) All the above

**50. Which of the following require large computer memory?**

(a) Imaging (b) Graphics

(c) Voice (d) All of the above

**51. The hardware components of a modern digital computer are connected to each other (logically and physically) by number of parallel wires. What are these wires called?**

(a) Cable (b) Bus

(c) Line (d) Conductor

**52. often computer users have information n two different files which they want to combine in one common file. When the two files are combined on after the other and end to end it is called**

(a) Sorting (b) Merging

(c) Searching (d) Concatenating

**53. Which of the following is not a factor when categorizing a computer?**

(a) Capacity of the storage devices

(b) Cost of the system

(c) Where it was purchased

(d) Speed of the output device

**54. The unit of hardware an operator uses to monitor computer processing is the**

(a) Card reader (b) CPU

(c) Line printer (d) Console

**55. What is meant by computer literacy?**

(a) Ability to write computer programs

(b) Knowing what a computer can and cannot do

(c) Knowing computer related vocabulary

(d) Ability to assemble computers

**56. A computer program that translates one program instruction at a time into machine language is called a/an**

(a) Interpreter (b) CPU

(c) Compiler (d) Simulator

**57. What does OCR stand for?**

(a) Out sized character reader

(b) Optical character recognition

(c) Operational character reader

(d) Only character reader

**58. Which of the following is the most powerful type of computer?**

(a) Super micro (b) Microcomputer

(c) Super computer (d) Mega frame

**59. The daily processing of corrections to customer accounts best exemplifies the processing mode of**

(a) Batch processing

(b) Real-time processing

(c) Time-sharing

(d) Off-line processing

**60. Which of the following does not contain a microprocessor?**

(a) Robot

(b) Microwave oven

(c) Washing Machine

(d) Ball pen

**61. In a microcomputer keyboard if you discover a mistake after inputting data with the enter key, which key will have to be pressed to retype the data?**

(a) Control key (b) Insert key

(c) Backspace key (d) Tab key

**62. Which out of the following is not an alternative name for primary memory?**

(a) Main memory (b) Primary storage

(c) Internal storage (d) mass Storage

**63. Which kind of storage device can be carried around?**

(a) Hard disk (b) Diskette

(c) Main memory (d) Motherboard

**64. Which out of the following terms could be used to describe the concurrent processing of computer programs, via CRTs, on one computer system?**

(a) Timesharing

(b) On-line processing

(c) Interactive processing

(d) All the above processing

**65. A compute has on more sense than a light**

(a) Bulb (b) Pen (c) Switch (d) Pad

**66. A computer has a 1024k memory. What does the letter k stand for?**

(a) Kilometer (b) Thousand

(c) 1024 (d) Core

**67. What is microprocessor?**

(a) Same as a micro computer

(b) A small place of equipment

(c) A small device that controls other equipment

(d) A way of doing something fast

**68. What of the following terms is related to a monitor?**

(a) Screen

(b) Monochrome monitor

(c) RGB monitor

(d) Video display

**69. Which one of the following can read data and convert them to a form that a computer can use?**

(a) Logic (b) Storage

(c) Control (d) Input device

**70. The analog computer measures dimensions and its circuits use the differential and integral equations of continuous variables. The digital computer counts units and its circuits use**

(a) Logic gates

(b) Discrete switches

(c) Boolean algebra

(d) Bayes’ theorem

**71. A piece of computer hardware that is physically placed between tow devices each of which manages data in a different way is called**

(a) Modem (b) Interface

(c) kluge (d) Data bus

**72. Which of the following people probably has the least amount of technical knowledge?**

(a) Programmer

(b) User

(c) Systems analyst

(d) Computer operator

**73. Which one of the following can produce the final product of machine processing in a form usable by humans?**

(a) Storage (b) Control

(c) Input device (d) Output device

**74. The pieces of equipment which are attached to the CPU of a computer and which it can access are called**

(a) Output devices (b) Control Units

(c) Peripherals (d) ALU

**75. The microelectronics is the technology of**

(a) Microprocessors

(b) Microcomputers

(c) Chips

(d) Automatic processing

**76. Which of the following devices allows the user to add components and capabilities to a computer system?**

(a) Storage devices (b) System boards

(c) Diskettes (d) Expansion slots

**77. In computer terminology a compiler means**

(a) A person who computes source programs

(b) The same thing as a programmer

(c) Key punch operator

(d) A program which translates source program into object program

**78. A computer is a box full of electronic**

(a) chip (b) Switching devices

(c) Circuits (d) Components

**79. The function of CPU is…………**

(a) To provide external storage of text

(b) To communicate with the operator

(c) To read, interpret and process the information and instruction

**80. As compared to the secondary memory, the primary memory of a computer is**

(a) Large (b) Cheap

(c) Fast (d) Slow

**81. Which of the following terms applies to communication between separate computer systems?**

(a) Compute literacy

(b) Power supply

(c) Applications software

(d) Connectivity

**82. A computer program consists of**

(a) A completed flowchart

(b) Algorithms

(c) Algorithms written in computer’s languages

(d) Discrete logical steps

**83. The first electronic general purpose digital computer built by Mauchly and Eckert called ENIAC did not work on the stored program principle. How many numbers could it store in its internal memory?**

(a) 100 (b) 20 (c) 500 (d) 1000

**84. following is a way to access secondary memory**

(a) Random access memory

(b) Action method

(c) Transfer method

(d) Density method

**85. Multiple choice examination answer sheets are evaluated by ………… reader**

(a) Optical mark (b) Optical character

(c) Magnetic ink character

(d) Magnetic tap

**86. Which of the following best describes a computer-based information system?**

(a) A system in which a compute is used to turn data into information

(b) Inputting data

(c) Processing data

(d) Performing complex mathematical calculations

**87. List of detailed instructions that directs a computer is called which one of the following**

(a) Logic (b) Storage

(c) Memory (d) Program

**88. The physical equipment made of various metals, silicon and plastic components they make up the parts of a computer is called**

(a) Micro (b) Peripheral

(c) Hardware (d) Disk drive

**89. The model base would most likely be organized**

(a) Sequential (b) Partitioned

(c) Indexed sequential

(d) Direct

**90. Plotters print**

(a) With ball point pens

(b) With ink pens

(c) Electrostatic ally

(d) All of the above

**91. Which of the following is a example processing activities?**

(a) Classifying

(b) Performing calculations

(c) Sorting

(d) All of the above

**92. The term “memory” applies to which one of which one of the following?**

(a) Logic (b) Storage

(c) control (d) Input device

**93. The attribution of human from or qualities to things such as machines or computers is called**

(a) Cybernetics

(b) Cybernation

(c) Artificial intelligence

(d) Anthropomorphism

**94. A floppy disk can contain approximately**

(a) 2,500 bytes (b) 25,5000 bytes

(c) 1,440, 000 bytes (d) 2,500,000 bytes

**95. A slow input unit such as a card reader would be attached to the CPU by means of a**

(a) Selector channel

(b) Buffer channel

(c) Byte multiplexer channel

(d) Block multiplexer channel

**96. Which of the following pieces of hardware is used the most in the input phase of a computer-based information system?**

(a) Printer (b) Diskette

(c) Monitor (d) Keyboard

**97. A sources program is the program written in …….language?**

(a) English (b) Symbolic

(c) High-level (d) Machine

**98. A new technology which provides the ability to create an artificial world ad have people interact with it is called**

(a) Televirtuality (b) virtual reality

(c) Alternative reality (d) 3-D reality

**99. MICR has made possible a**

(a) Cashless society

(b) Checkless society

(c) Credit less society

(d) None of the above

**100. The central compute in a distributed processing system is called the**

(a) Father (b) Monitor

(c) Multiplexer (d) Host

**101. Which of the following statement best describes the batch method of input?**

(a) Data is processed as soon as it is input

(b) Data is input at the time it is collected

(c) Data is collected in the from of source documents placed into groups, and then input to the computer

**102. A program written in machine language is called…program?**

(a) Assembler (b) object

(c) Computer (d) Machine

**103. The subject of Cybernetics deals with the science of**

(a) Genetics

(b) Control and communications

(c) Molecular biology

(d) Biochemistry

**104. A computer set of programs for one specific data processing application is called**

(a) Utility application

(b) Canned program

(c) Program package

(d) Both b and c

**105. A characteristic of the ASCII code is**

(a) It limitation to a maximum of 96 character configurations

(b) Its use of the zone code 1010, 1011, and 1100

(c) Its independence from the Hollerith code

(d) All the above

**106. Which of the following might occur when an organization used on-line processing?**

(a) Data is acted on immediately

(b) Master files are updated immediately

(c) Output is produced without delay

(d) All related files are updated

**17. A ADU is used as**

(a) Input device (b) Output device

(c) Voice data entry device

(d) Both a and b

**108. What is name given to the molecular-scale computer**

(a) Supercomputer (b) Nanocomputer

(c) Femtocomputer (d) Microcomputer

**109. A billionth of a second is defined as a**

(a) Millisecond (b) Microsecond

(c) Nanosecond (d) Picoseconds

**110. In virtual storing, program segments stored on disk during processing are called**

(a) Sections (b) Partitions

(c) Pages (d) Sectors

**111. The principal advantage of the centralized approach to organizing a computer facility.**

(a) Cost-effectiveness

(b) Processing activates are easier to control

(c) Processing standards can be enforced

(d) All of the above

**112. The retrieval of information from the computer is defined as**

(a) Collection of data

(b) Data retrieval operations

(c) Output

(d) Data output collection

**113. Human beings are referred to as Homosapiens. Which device is called silicon sapiens?**

(a) Monitor (b) Hardware

(c) Robot (d) Compute

**114. The CPU of a computer transfers print output of a temporary disk memory at with speed and then gets back to processing another job without waiting for the output to go to the printer. In this way, the CPU does not remain idle due to its own high speed as compared to the low speed of the printer. What is the name of this memory?**

(a) External memory

(b) I/O memory

(c) ROM

(d) Buffer memory

**115. Which of the following isn’t used in the storage phase of a computer –based information system?**

(a) Magnetic (b) Keyboard

(c) Diskette (d) Hard disk

**116. The basic components of a modern digital computer are**

(a) Central processor

(b) Input device

(c) Output device

(d) All of the above

**117. No computer can do anything without a**

(a) Program (b) Memory

(c) Chip (d) Output device

**118. What is meant by the term RAM?**

(a) Memory which can only be read

(b) Memory which can be both read and written to

(c) Memory which is used for permanent storage

(d) memory which can only be written to

**119. The two kind of main memory are**

(a) Primary and secondary

(b) Random and sequential

(c) ROM and RAM

(d) Central and peripheral

**120. Data System management has long –term viability as a separate business function because**

(a) It requires much technical knowledge

(b) It requires large investments

(c) Specialists in data systems cannot be integrated into a marketing of manufacturing organization

(d) An integrated database accessible to all requires independent management

**121. Arithmetic and Logic Unit (ALU) are called the …. Of a computer**

(a) Heart

(b) Master dispatcher

(c) Primary memory

(d) All of the above

**122. Through a compute can replace people in dull and routine tasks, yet it lacks**

(a) Initiative (b) Originality

(c) Speed (d) Accuracy

**123. Which of the following s not a part of the CPU?**

(a) Storage unit

(b) Arithmetic and logic unit

(c) program unit

(d) Control unit

**124. The i8nput bottleneck has been relieved by**

(a) key-to-tape machines

(b) Combination keypunch and key verifier machines

(c) MICR (d) All of the above

**125. To be information, data must be**

(a) Factual (b) Relevant

(c) News (d) All of the above

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | C | 2 | B | 3 | C | 4 | D | 5 | C |
| 6 | B | 7 | B | 8 | C | 9 | D | 10 | B |
| 11 | C | 12 | C | 13 | C | 14 | D | 15 | B |
| 16 | C | 17 | D | 18 | B | 19 | B | 20 | A |
| 21 | B | 22 | C | 23 | D | 24 | A | 25 | D |
| 26 | D | 27 | C | 28 | B | 29 | D | 30 | D |
| 31 | A | 32 | B | 33 | C | 34 | D | 35 | C |
| 36 | C | 37 | D | 38 | B | 39 | A | 40 | A |
| 41 | C | 42 | B | 43 | C | 44 | D | 45 | B |
| 46 | B | 47 | D | 48 | D | 49 | D | 50 | D |
| 51 | B | 52 | D | 53 | C | 54 | D | 55 | B |
| 56 | A | 57 | B | 58 | C | 59 | A | 60 | D |
| 61 | C | 62 | D | 63 | B | 64 | D | 65 | C |
| 66 | C | 67 | C | 68 | D | 69 | D | 70 | C |
| 71 | B | 72 | B | 73 | D | 74 | C | 75 | C |
| 76 | D | 77 | D | 78 | B | 79 | C | 80 | C |
| 81 | D | 82 | C | 83 | B | 84 | A | 85 | A |
| 86 | A | 87 | D | 88 | C | 89 | B | 90 | D |
| 91 | D | 92 | B | 93 | D | 94 | C | 95 | C |
| 96 | D | 97 | C | 98 | B | 99 | A | 100 | D |
| 101 | C | 102 | B | 103 | B | 104 | C | 105 | C |
| 106 | B | 107 | D | 108 | B | 109 | C | 110 | C |
| 111 | D | 112 | C | 113 | D | 114 | D | 115 | B |
| 116 | D | 117 | A | 118 | B | 119 | C | 120 | D |
| 121 | A | 122 | B | 123 | C | 124 | C | 125 | D |