COMPUTER SCIENCE

11th STANDARD

1-MARKS, SHORT Q&A, DETAILS Q&A

STUDY MATERIAL

NAME : _____

SCHOOL: _____

_____.

Prepared By

Tr.T.Thirumalai, M.Sc(CS)., B.Ed.,

FUNDAMENTALS OF COMPUTERS

CHAPTER – 1 INTRODUCTION TO COMPUTER

Book Back 1-Marks

Choose the correct answer:

1. First generation computers used

   (a) Vacuum tubes (b) Transistors (c) Integrated circuits (d) Microprocessors

2. Name the volatile memory (a) ROM (b) PROM **(c) RAM** (d) EPROM

3. Identify the output device (a) Keyboard (b) Memory **(c) Monitor** (d) Mouse

4. Identify the input device (a) Printer **(b) Mouse** (c) Plotter (d) Projector

5. _____ Output device is used for printing building plan, flex board, etc.

   (a) Thermal printer **(b) Plotter** (c) Dot matrix (d) inkjet printer

Extra 1-Marks

1. _____ Example of First Generation Computer.
   a. IBM 1401 b. VLSI c. IBM 360 Series **d. ENIAC**
2. _____ Languages used in Third generation Computer.
   a. Machine Level b. Object Code **c. High Level** d. Assembly Level
3. _____ is defined as an unprocessed collection.
   a. Datum **b. Data** c. Process d. Project
4. The CPU has _____ components in Computer.
   a. 2 b. 4 **c. 3** d. 5
5. _____ Device is used to insert the Alpha-Numeric data into Computer.
   a. Mouse b. Printer c. Monitor **d. Keyboard**
6. _____ memory is a Volatile.
   a. **Primary** b. PROM c. Secondary d. ROM
7. The _____ converts any type of printed or written information including photographs into a digital format.
   a. Monitor **b. Scanner** c. Printer d. Digital Camera
8. A _____ is a device for signaling by hand, by way of pressing one or more switches.
   a. Keyboard b. Printer **c. Keyer** d. Touch Screen
9. Pictures on a monitor are formed with picture elements called _____.
   a. Points b. Dots c. inches **d. Pixels**
10. A _____ printer that prints using a fixed number of pins or wires.
    a. Laser b. Ink Jet c. Plotter **d. Dot-matrix**
11. _____ are used to produce computer output on a big screen.
    a. Monitors b. Touch Screen c. Plotter **d. Multimedia Projector**
12. An _____ is a basic software that makes the computer to work.
    a. Ms-Office b. Ms-Paint **c. Operation System** d. Note Pad
13. Booting process has _____ Types.
    a. 3 **b. 2** c. 5 d. 1
14. _____ is the physical component of a computer.
    a. Software b. Application **c. Hardware** d. Power
15. "An act of Calculating" means _____.
    a. **Computing** b. Arithmetic c. numbers d. calculations
16. _____ is the first known calculating machine counting.
    a. **Analytical Engine** b. Abacus c. Calculator d. Computer

17. The first generation computers were used between _____.
    a. 1940 – 1955 b. 1941 – 1956 **c. 1942 – 1955** d. 1941- 1955
18. The first generation computers used _____ for memory.
    a. Magnetic circuitry **b. Magnetic drums** c. Magnetic tubes d. Magnetic buses
19. Transistors were made smaller in size and placed on _____ chips.
    a. Integrated **b. Silicon** c. Magnetic d. Circuit
20. The primary memory is _____ in nature.
    a. Peripheral **b. Volatile** c. Non- Volatile d. Main memory
21. The second generation computers were used between _____.
    a. **1954 – 1964** b. 1951 – 1966 c. 1950 – 1956 d. 1961- 1965
22. The third generation computers were used between _____.
    a. 1964 – 1975 b. 1961 – 1971 c. 1960 – 1975 **d. 1964- 1975**
23. The fourth generation computers were used between _____.
    a. **1975 – 1980** b. 1971 – 1981 c. 1970 – 1975 d. 1974- 1985
24. ____ is the major component which interprets and executes software instructions.
    a. Input unit b. Output unit c. Memory **d. CPU**
25. In _____ Mouse uses Laser Light
    a. Optical b. Mechanical **c. Laser** d. Air
26. _____ types of Printer in the categories. a. 3 **b. 2** c. 4 d.1
27. Laser printer print _____ pages per minutes. **a. 100** b.150 c. 80 d. 120
28. Line printers are capable of printing much more than _____ Lines Per Minute.
    a. 1500 **b. 1000** c. 500 d. 800
29. _____is the physical component of a computer.
    a. **Hardware** b. Software c. Application d. Picture
30. The speed of Inkjet printers generally range from _____ Page Per Minute.
    a. 1-10 b. 1-15 c. 15-20 **d.1-20**
31. _____ serves as a voice Input device.
    a. Speakers b. Scanner c. Printer **d. Microphone**
32. _____ is the set of programs or instructions.
    a. Hardware **b. Software** c. Application d. Picture
33. The computer mouse as we know it today was invented and developed by _____.
    a. **Douglas Engelbart** b. Douglas Lee c. Charles Babbage d. Napier
34. Third generation computers, used_____
    a. Vacuum Tube b. Transistor **c. Integrated Circuit** d. Micro Processor
35. When the system starts from initial state _____
    a. Computing **b. Cold Booting** c. Warm Booting d. BIOS
36. When the system restarts or when Reset button is pressed, we call it _____.
    a. Computing b. Cold Booting **c. Warm Booting** d. BIOS
37. The _____ is the combination of hardware and software.
    a. Calculator **b. Computer** c. ALU d. CPU
38. CPU interprets and executes software instructions.
    a. **CPU** b. ALU c. monitor d. mouse
39. _____ Printers use colour cartridges.
    a. Laser b. Dot Matrix c. Thermal **d. Inkjet**
40. _____ is used to feed any form of data to the computer.
    a. Output Unit b. Processing c. Memory Unit **d. Input Unit**

EXPLANATION :

- ALU – Arithmetic Logic Unit
- CPU – Central Processing Unit
- CU – Control Unit
- IC – Integrated Circuits
- GUI - Graphical User Interface
- VLSI - Very Large Scale Integrated Circuits.
- ULSI – Ultra Large Scale Integration
- ENIAC - Electronic Numerical Integrator And Calculator
- NLP - Natural Language Processing
- AI - Artificial Intelligence
- RAM – Random Access Memory
- ROM – Read Only Memory
- QR – Quick Response
- OCR – Optical Character Reader
- CCD - Charge Coupled Device
- CRT - Cathode Ray Tube
- LCD - Liquid Crystal Display
- LED - Light Emitting Diode
- VGA - Video Graphics Array
- CPS - Character Per Second
- PIXEL – Picture Element
- CPS - Character Per Second
- DPI - Dots Per Inch
- PPM - Page Per Minute
- POST - Power on Self Test
- BIOS - Basic Input Output System
- OS - Operating system

Question and Answer:

What is a Computer?

A **computer** is an electronic device that manipulates information, or data. It has the ability to store, retrieve, and process data.
Computer works faster than human being and given the values more accuracy and reliable.

Write about Charles Babbage.

- Is considered to be the **father of computer**.
- His invention and the concept of **Analytical Engine in 1837**.
- The Analytical Engine contained an Arithmetic Logic Unit (ALU), basic flow control, and integrated memory; which led to the development of first general - purpose computer concept.

What are the Characteristics of Computer?

Computer is the powerful machine. It can perform large number of tasks. The main capacities of computer are work length, speed accuracy, diligence, versatility memory and automation and lots of more tasks.

Write the Generation of Computer.

First Generation	1942-1955	**Vacuum tubes**
Second Generation	1955-1964	**Transistors**
Third Generation	1964-1975	**Integrated Circuits (IC)**
Fourth Generation	1975-1980	**Microprocessor** Very Large Scale Integrated Circuits (VLSI)
Fifth Generation	1980 – till date	Ultra Large Scale Integration (ULSI)
Sixth Generation	In future	

The first digital computer

The ENIAC (Electronic Numerical Integrator And Calculator) was invented by J. Presper Eckert and John Mauchly.
It occupied about 1,800 square feet and used about 18,000 vacuum tubes, weighing almost 50 tons. ENIAC was the first digital computer because it was fully functional.

Write the Applications of computer.

A computer has high speed of calculation, diligence, accuracy, reliability, or versatility which made it an integrated part of our life as well as business organisations. Computers are being used almost every walk of life.

Write the functions of Arithmetic and Logic Unit

The ALU is a part of the CPU where various computing functions are performed on data. The ALU performs arithmetic operations such as addition, subtraction, multiplication, division and logical operations. The result of an operation is stored in internal memory of CPU. The logical operations of ALU promote the decision-making ability of a computer.

Write the significant features of Monitor.

Monitor is the most commonly used output device to display the information. It looks like a TV. Pictures on a monitor are formed with picture elements called PIXELS. Monitors may either be Monochrome which display text or images in Black and White or can be color, which display results in multiple colors.

There are many types of monitors available such as CRT (Cathode Ray Tube), LCD (Liquid Crystal Display) and LED (Light Emitting Diodes). The monitor works with the VGA (Video Graphics Array) card.

The video graphics card helps the keyboard to communicate with the screen. It acts as an interface between the computer and display monitor. Usually the recent motherboards incorporate built-in video card.

Distinguish between Data and Information.

Data:

Data is defined as an unprocessed collection of raw facts, suitable for communication, interpretation or processing.

For example, 134, 16, 'Kavitha', 'C' is data. This will **not give any meaningful message.**

Information:

Information is a collection of facts from which conclusions may be drawn. In simple words we can say that data is the raw facts that are processed to give meaningful, ordered or structured information.

For example Kavitha is 16 years old. This information is about Kavitha **and conveys some meaning**. This conversion of data into information is called data processing.

Write the Components of a Computer.

1. Input Unit 2.Central Processing Unit (Control Unit, Arithmetic Logic Unit, Memory Unit) 3.Output Unit

Write about Input Unit and Output Unit.

Input Unit

Input unit is used to feed any form of data to the computer, which can be stored in the memory unit for further processing. **Example: Keyboard, mouse, etc.**

Output Unit

An Output Unit is any hardware component that conveys information to users in an understandable form. **Example: Monitor, Printer etc.**

Write about the Central Processing Unit.

CPU is the major component which interprets and executes software instructions. It also controls the operation of all other components such as memory, input and output units. It accepts binary data as input process the data according to the instructions and provides the result as output.

The CPU has three components which are Control unit, Arithmetic and logic unit (ALU) and Memory unit.

Write about Arithmetic and Logic Unit.

The ALU is a part of the CPU where various computing functions are performed on data. The ALU performs arithmetic operations such as addition, subtraction, multiplication, division and logical operations. The result of an operation is stored in internal memory of CPU.

The logical operations of ALU promote the decision-making ability of a computer.

Write about Control Unit.

The control unit controls the flow of data between the CPU, memory and I/O devices. It also controls the entire operation of a computer.

Write about Memory Unit / Storage Unit.

The Memory Unit is of two types which are primary memory and secondary memory. The primary memory is used to temporarily store the programs and data when the instructions are ready to execute. The secondary memory is used to store the data permanently.

Distinguish between Primary memory and Secondary Memory.

- The **Primary Memory** is volatile, that is, the content is lost when the power supply is switched off.
- The Random Access Memory (RAM) is an example of a main memory.
- The **Secondary memory** is non volatile, that is, the content is available even after the power supply is switched off.
- Hard disk, CD-ROM and DVD ROM are examples of secondary memory.

List out the Types of Input Devices.

Keyboard, Mouse, Scanners, Track Ball, Optical Character Reader, Input Voice System, Light Pen, Bar Code / QR Code Reader, Digital Camera, Touch Screen, Keyer are the Input Devices.

List out the Types of Output Devices.

Monitors, Printers, Speakers, Plotter, Multimedia Projectors are the Output Devices.

Difference between Optical and Laser Mouse

Optical Mouse	Laser Mouse
• Measures the motion and acceleration of pointer. • It uses light source instead of ball to judge the motion of the pointer. • Optical mouse has three buttons. • Optical mouse is less sensitive towards surface.	• Measures the motion and acceleration of pointer. • Laser Mouse uses Laser Light. • Laser Mouse is highly sensitive and able to work on any hard surface.

Write about Sixth Generation Computer.

In the Sixth Generation, computers could be defined as the era of intelligent computers, based on Artificial Neural Networks. One of the most dramatic changes in the sixth generation will be the explosive growth of Wide Area Networking. Natural Language Processing (NLP) is a component of Artificial Intelligence (AI). It provides the ability to develop the computer program to understand human language.

Explain the Generation of Computer

Generation	Period	Main Component used	Merits/Demerits
First Generation	1942-1955	**Vacuum tubes**	• Big in size • Consumed more power • Malfunction due to overheat • Machine Language was used
First Generation Computers - ENIAC , EDVAC , UNIVAC 1 ENIAC weighed about 27 tons, size 8 feet × 100 feet × 3 feet and consumed around 150 watts of power			
Second Generation	1955-1964	**Transistors**	• Smaller compared to First Generation • Generated Less Heat • Consumed less power compared to first generation • Punched cards were used • First operating system was developed - Batch Processing and Multiprogramming Operating System • Machine language as well as Assembly language was used.
Second Generation Computers **IBM 1401, IBM 1620, UNIVAC 1108**			
Third Generation	1964 -1975	**Integrated Circuits (IC)**	• Computers were smaller, faster and more reliable • Consumed less power • High Level Languages were used
Third Generation Computers **IBM 360 series, Honeywell 6000 series**			
Fourth Generation	1975-1980	**Microprocessor** Very Large Scale Integrated Circuits (VLSI)	• Smaller and Faster • Microcomputer series such as IBM and APPLE were developed • Portable Computers were introduced.
Fifth Generation	1980 - till date	**Ultra Large Scale Integration (ULSI)**	• Parallel Processing • Super conductors • Computers size was drastically reduced. • Can recognize Images and Graphics

			• Introduction of Artificial Intelligence and Expert Systems • Able to solve high complex problems including decision making and logical reasoning
Sixth Generation	In future		• Parallel and Distributed computing • Computers have become smarter, faster and smaller • Development of robotics • Natural Language Processing • Development of Voice Recognition Software

Explain the Input and Output Devices.

Input Devices:

(1) Keyboard:

Keyboard (wired / wireless, virtual) is the most common input device used today. The individual keys for letters, numbers and special characters are collectively known as character keys. This keyboard layout is derived from the keyboard of original typewriter. The data and instructions are given as input to the computer by typing on the keyboard. Apart from alphabet and numeric keys, it also has Function keys for performing different functions. There are different set of keys available in the keyboard such as character keys, modifier keys, system and GUI keys, enter and editing keys, function keys, navigation keys, numeric keypad and lock-keys.

(2) Mouse:

Mouse (wired/wireless) is a pointing device used to control the movement of the cursor on the display screen. It can be used to select icons, menus, command buttons or activate something on a computer. Some mouse actions are move, click, double click, right click, drag and drop.

(3) Scanner:

Scanners are used to enter the information directly into the computer's memory. This device works like a Xerox machine. The scanner converts any type of printed or written information including photographs into a digital format, which can be manipulated by the computer.

(4)Fingerprint Scanner:

Finger print Scanner is a fingerprint recognition device used for computer security, equipped with the fingerprint recognition feature that uses biometric technology. Fingerprint Reader / Scanner is a very safe and convenient device for security instead of using passwords, which is vulnerable to fraud and is hard to remember.

(5) Track Ball:

Track ball is similar to the upside- down design of the mouse. The user moves the ball directly, while the device itself remains stationary. The user spins the ball in various directions to navigate the screen movements.

(6) Retinal Scanner:

This performs a retinal scan which is a biometric technique that uses unique patterns on a person's retinal blood vessels.

(7) Light Pen:

A light pen is a pointing device shaped like a pen and is connected to a monitor. Te tip of the light pen contains a light-sensitive element which detects the light from the screen enabling the computer to identify the location of the pen on the screen. Light pens have the advantage of

'drawing' directly onto the screen, but this becomes hard to use, and is also not accurate.

(8) Optical Character Reader:

It is a device which detects characters printed or written on a paper with OCR, a user can scan a page from a book. The Computer will recognize the characters in the page as letters and punctuation marks and stores. The Scanned document can be edited using a word processor.

(9) Bar Code / QR Code Reader:

A Bar code is a pattern printed in lines of different thickness. Te Bar code reader scans the information on the bar codes transmits to the Computer for further processing. Te system gives fast and error free entry of information into the computer. QR (Quick response) Code: The QR code is the two dimension bar code which can be read by a camera and processed to interpreter the image

(10) Voice Input Systems:

Microphone serves as a voice Input device. It captures the voice data and sends it to the Computer. Using the microphone along with speech recognition software can offer a completely new approach to input information into the Computer.

(11) Digital Camera:

It captures images / videos directly in the digital form. It uses a CCD (Charge Coupled Device) electronic chip. When light falls on the chip through the lens, it converts light rays into digital format.

(12) Touch Screen:

A touch screen is a display device that allows the user to interact with a computer by using the finger. It can be quite useful as an alternative to a mouse or keyboard for navigating a Graphical User Interface (GUI). Touch screens are used on a wide variety of devices such as computers, laptops, monitors, smart phones, tablets, cash registers and information kiosks. Some touch screens use a grid of infrared beams to sense the presence of a finger instead of utilizing touch-sensitive input.

(13) Keyer:

A Keyer is a device for signaling by hand, by way of pressing one or more switches. Modern keyers have a large number of switches but not as many as a full size keyboard. Typically, this number is between 4 and 50. A keyer differs from a keyboard, which has "no board", but the keys are arranged in a cluster.

Output Devices:

(1) Monitor:

Monitor is the most commonly used output device to display the information. It looks like a TV. Pictures on a monitor are formed with picture elements called PIXELS. Monitors may either be Monochrome which display text or images in Black and White or can be color, which display results in multiple colors. There are many types of monitors available such as CRT (Cathode Ray Tube), LCD (Liquid Crystal Display) and LED (Light Emitting Diodes). The monitor works with the VGA (Video Graphics Array) card. The video graphics card helps the keyboard to communicate with the screen. It acts as an interface between the computer and display monitor. Usually the recent motherboards incorporate built-in video card.

The first computer monitor was part of the Xerox Alto computer system, which was released on March 1, 1973.

(2) Plotter:

Plotter is an output device that is used to produce graphical output on papers. It uses single color or multi color pens to draw pictures.

(3) Printers:

Printers are used to print the information on papers. Printers are divided into two main categories:

- Impact Printers
- Non Impact printers

Impact Printers

These printers print with striking of hammers or pins on ribbon. These printers can print on multi-part (using carbon papers) by using mechanical pressure. For example, Dot Matrix printers and Line matrix printers are impact printers. A Dot matrix printer that prints using a fixed number of pins or wires. Each dot is produced by a tiny metal rod, also called a "wire" or "pin", which works by the power of a tiny electromagnet or solenoid, either directly or through a set of small levers. It generally prints one line of text at a time. Te printing speed of these printers varies from 30 to 1550 CPS (Character Per Second).

Line matrix printers use a fixed print head for printing. Basically, it prints a page-wide line of dots. But it builds up a line of text by printing lines of dots. Line printers are capable of printing much more than 1000 Lines Per Minute, resulting in thousands of pages per hour. These printers also uses mechanical pressure to print on multi-part (using carbon papers).

Non-Impact Printers

These printers do not use striking mechanism for printing. They use electrostatic or laser technology. Quality and speed of these printers are better than Impact printers. For example, Laser printers and Inkjet printers are non-impact printers.

Laser Printers

Laser printers mostly work with similar technology used by photocopiers. It makes a laser beam scan back and forth across a drum inside the printer, building up a pattern. It can produce very good quality of graphic images. One of the chief characteristics of laser printer is their resolution – how many Dots per inch(DPI). The available resolution range around 1200 dpi. Approximately it can print 100 pages per minute(PPM).

Inkjet Printers:

Inkjet Printers use colour cartridges which combined Magenta, Yellow and Cyan inks to create color tones. A black cartridge is also used for monochrome output. Inkjet printers work by spraying ionized ink at a sheet of paper. Te speed of Inkjet printers generally range from 1-20 PPM (Page Per Minute).

They use the technology of firing ink by heating it so that it explodes towards the paper in bubbles or by using piezoelectricity in which tiny electric currents controlled by electronic circuits are used inside the printer to spread ink in jet speed. An Inkjet printer can spread millions of dots of ink at the paper every single second.

Speakers:

Speakers produce voice output (audio) . Using speaker along with speech synthesize software, the computer can provide voice output. This has become very common in places like airlines, schools, banks, railway stations, etc..

Multimedia Projectors:

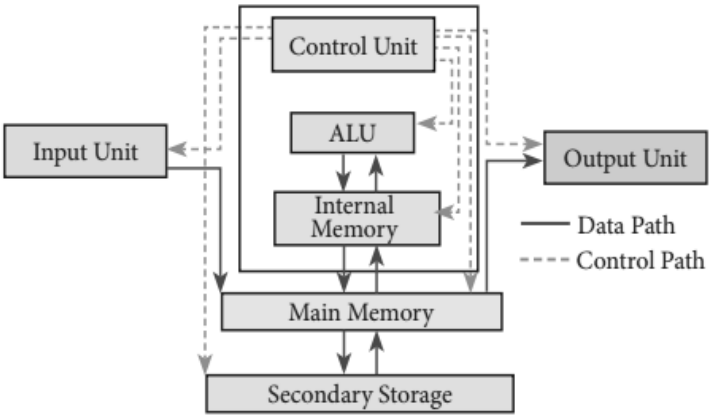
Multimedia projectors are used to produce computer output on a big screen. These are used to display presentations in meeting halls or in classrooms.

Explain the Components of a Computer

The computer is the combination of hardware and software. Hardware is the physical component of a computer like motherboard, memory devices, monitor, keyboard etc., while

software is the set of programs or instructions. Both hardware and software together make the computer system to function.

Let us first have a look at the functional components of a computer. Every task given to a computer follows an Input- Process- Output Cycle (IPO cycle). It needs certain input, processes that input and produces the desired output. The input unit takes the input, the central processing unit does the processing of data and the output unit produces the output. The memory unit holds the data and instructions during the processing.



Components of a Computer (Block Diagram)

Input Unit

Input unit is used to feed any form of data to the computer, which can be stored in the memory unit for further processing. Example: Keyboard, mouse, etc.

Central Processing Unit

CPU is the major component which interprets and executes software instructions. It also controls the operation of all other components such as memory, input and output units. It accepts binary data as input, process the data according to the instructions and provide the result as output. The CPU has three components which are Control unit, Arithmetic and logic unit (ALU) and Memory unit.

Arithmetic and Logic Unit

The ALU is a part of the CPU where various computing functions are performed on data. The ALU performs arithmetic operations such as addition, subtraction, multiplication, division and logical operations. The result of an operation is stored in internal memory of CPU. The logical operations of ALU promote the decision-making ability of a computer.

Control Unit

The control unit controls the flow of data between the CPU, memory and I/O devices. It also controls the entire operation of a computer.

Output Unit

An Output Unit is any hardware component that conveys information to users in an understandable form. Example: Monitor, Printer etc.

Memory Unit

The Memory Unit is of two types which are primary memory and secondary memory. The primary memory is used to temporarily store the programs and data when the instructions are ready to execute. The secondary memory is used to store the data permanently. The Primary Memory is volatile, that is, the content is lost when the power supply is switched off. The Random Access Memory (RAM) is an example of a main memory. The Secondary memory is non volatile, that is, the content is available even after the power supply is switched off. Hard disk, CD-ROM and DVD ROM are examples of secondary memory.

CHAPTER -2 NUMBER SYSTEM

Choose the Correct Answer:

1. Which refers to the number of bits processed by a computer's CPU?
   A) Byte **B) Nibble** C) Word length D) Bit
2. How many bytes does 1 Kilo Byte contain? A) 1000 B) 8 C) 4 **D) 1024**
3. Expansion for ASCII
   A) American School Code for Information Interchange
   B) American Standard Code for Information Interchange
   C) All Standard Code for Information Interchange
   D) American Society Code for Information Interchange
4. 2^50 is referred as A) Kilo B) Tera **C) Peta** D) Zetta
5. How many characters can be handled in Binary Coded Decimal System?
   A) 64 B) 255 C) 256 D) 128
6. For 1101_2 what is the Hexadecimal equivalent? A) F B) E **C) D** D) B
7. What is the 1's complement of 00100110?
   A) 00100110 **B) 11011001** C) 11010001 D) 00101001
8. Which amongst this is not an octal number? A) 645 B) 234 **C) 876** D) 123
9. The term data comes from the word _____
   A) Datum B) Digit C) Datam D) Dateum
10. A _____ is a collection of 4 bits. A) Byte B) Boolean C) MB **D) Nibble**
11. The most commonly used numbering system is the _____ system.
    A) Binary **B) Decimal** C) Octal D) Hexadecimal
12. A _____ is small piece of data that is derived from the words "BInary DigiT" .
    A) Byte b) BIT C) Kilo Byte D) Mega Byte
13. A collection of 8 bits is called as a _____.
    A) Byte B) KB C) Bit D) MB
14. _____ have only two possible values, 0 and 1.
    A) Byte B) KB **C) BIT** D) MB
15. The most commonly used coding scheme _____.
    A) BCD **B) ASCII** C) EBCID D) ISCII
16. The left most bit in the binary number is called as _____.
    A) LSB B) SLB **C) MSB** D) LMB
17. The right most bit in the binary number is called as _____.
    A) LSB B) SLB C) MSB D) LMB

18. BCD – Binary Coded Decimal.
19. EBCDIC – Extended Binary Coded Decimal Interchange Code.
20. ASCII – American Standard Code for Information Interchange.
21. Unicode.
22. ISCII - Indian Standard Code for Information Interchange.
23. MSB- Most Significant Bit.
24. LSB- Least Significant Bit.
25. IBM - International Business Machine.

Question and Answer:

What is Data?

The term data comes from the word **datum**, which means a raw fact. The data is a fact about people, places or some objects.

Write the 1's complement procedure.

The steps to be followed to find 1's complement of a number:

Step 1: Convert given Decimal number into Binary

Step 2: Check if the binary number contains 8 bits , if less add 0 at the left most bit, to make it as 8 bits.

Step 3: Invert all bits (i.e. Change 1 as 0 and 0 as 1)

Convert $(46)_{10}$ into Binary number.

46 / 2 = 23 =0 → MSB
23 / 2 = 11= 1
11 / 2 = 5 = 1
5 / 2 = 2 = 1
2 / 2 = 1 = 0
LSB

$(46)_{10} = (101110)_2$

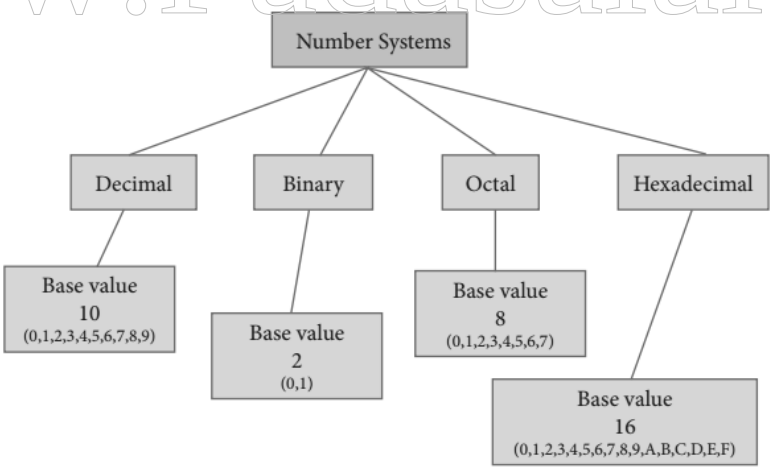
List the encoding systems for characters in memory.

There are several encoding systems used for computer. They are

- BCD – Binary Coded Decimal.
- EBCDIC – Extended Binary Coded Decimal Interchange Code.
- ASCII – American Standard Code for Information Interchange.
- Unicode
- ISCII - Indian Standard Code for Information Interchange.

What is radix of a number system? Give example.

The number systems are Decimal, Binary, Octal, Hexadecimal. Each number system is uniquely identified by its **base value** or **radix**. Radix or base is the count of number of digits in each number system. Radix or base is the general idea behind positional numbering system.



Example of Number System as Flow-diagram

Write note on binary number system.

There are only two digits in the Binary system, namely, 0 and 1. The numbers in the binary system are represented to the base 2 and the positional multipliers are the powers of 2.

Example The binary sequence (1101)2 has the decimal equivalent:

$$(1101)_2 = 1 \times 2^3 + 1 \times 2^2 + 0 \times 2^1 + 1 \times 2^0$$
$$= 8 + 4 + 0 + 1$$
$$= (13)_{10}$$

Convert $(150)_{10}$ into Binary, then convert that Binary number to Octal.

$(150)_{10} = (\ ?\ )_2$

150 / 2 = 75	= 0	→ MSB
75 / 2 = 37	= 1	
37 / 2 = 18	= 1	
18 / 2 = 9	= 0	
9 / 2 = 4	= 1	
4 / 2 = 2	= 0	
2 / 2 = 1	= 0	

LSB

$(150)_{10} = (10010110)_2$

$(10010110)_2 = (\ ?\ )_8$

$= \underbrace{010}\ \underbrace{010}\ \underbrace{110}$

$= 2 \quad 2 \quad 6$

$(10010110)_2 = (226)_8$