Chapter - I Introduction to Computers One Mark Questions:

1.Computer generation can be classified into 5 types

- 2. Charles Babbage is considered to be the father of computer
- 3. Analytical Engine was invented in the year 1837
- 4. First generation was invented in the year 1942-1955
- 5. Components used in First generation computers were Vacuum tubes
- 6.ENIAC Electronic Numerical Integrator And Calculator
- 7. UNIVAC-Universal Automatic Computer
- 8.EDVAC-Electronic Discrete Variable Automatic Computer
- 9. Machine Language was used in First Generation computers
- 10. ENIAC weighed about <u>27 tons</u>, size <u>8 feet × 100 feet × 3</u> feet and consumed around <u>150</u> watts of power
- 11. Second generation was invented in the year 1955-1964
- 12. Components used in Second generation computers was Transistors
- 13. Assembly language was used in Second Generation computers
- 14. Second Generation Computers IBM 1401, IBM 1620, UNIVAC 1108
- 15.IBM-International Business Machine
- 16. Third generation was invented in the year 1964-1975
- 17. Components used in Third generation computers was Integrated Circuits
- 18. High Level Language was used in Third Generation computers
- 19. Third Generation Computers IBM 360 series, Honeywell 6000 series
- 20. Fourth generation was invented in the year 1975-1980
- 21. Components used in Fourth generation computers was Microprocessor
- 22.VLSI Very Large Scale Integrated Circuits
- 23. Microcomputer series such as **IBM** and **APPLE** were developed during Fourth generation
- 24. Time period of Fifth generation is 1980 to till date
- 25.AI- Artificial Intelligence
- 26.ULSI Ultra Large Scale Integration
- 27. The ENIAC was invented by **J. Presper Eckert** and **John Mauchly**
- 28.ENIAC was began to construct in the year 1943

29. ENIAC occupied about <u>**1**,800 square feet</u> and used about <u>**18,000 vacuum tubes**</u>, weighing almost **50 tons**.

30. **ENIAC** was the first digital computer because it was fully functional

31.NLP-Natural Language Processing

32. Natural Language Processing (NLP) is a component of <u>Artificial Intelligence (AI)</u>.

33.<u>Natural Language Processing</u> provides the ability to develop the computer program to understand human language

34. The term "computer" is derived from the word "compute" which means to calculate

35. The person who performs calculation is called as **Computer**

36. **Data** is defined as an unprocessed collection of raw facts, suitable for communication,

interpretation or processing

37. Information is a collection of facts from which conclusions may be drawn

38. The conversion of data into information is called data processing

39. The computer is the combination of hardware and software

40. Hardware is the physical component of a computer

41. Motherboard, memory devices, monitor, keyboard are examples for Hardware.

42. Software is the set of programs or instructions

43. IPO - Input- Process- Output Ovele

44. Input unit is used to feed any form of data to the computer

45. Keyboard, Mouse are examples for Input Unit

46. <u>CPU</u> is the major component which interprets and executes software instructions

47.CPU control the operation of all other components such as memory, input and output unit

48.<u>CPU</u> accepts binary data as input, process the data according to the instructions and provide the result as output

49. The CPU has three components

50. The <u>ALU</u> is a part of the CPU where various computing functions are performed on data

51. The result of an ALU operation is stored in *internal memory* of CPU

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

53. The <u>Control unit</u> controls the flow of data between the CPU, memory and I/O devices

54. Control Unit controls the entire operation of a computer

55. An <u>Output Unit</u> is any hardware component that conveys information to users in an understandable form

56. The Memory Unit is of **two types** which are **<u>primary memory</u>** and <u>**secondary memory**</u>

57. <u>Primary memory</u> is used to temporarily store the programs

58. Primary Memory is volatile

- 59. <u>Secondary memory</u> is used to store the data permanently
- 60. Secondary Memory is non-volatile
- 61.**<u>RAM</u>** is an example for Main Memory
- 62. Harddisk, CD-ROM and DVD ROM are examples of secondary memory
- 63. Keyboard is the most common input device used today

64. Individual keys for letters, numbers and special characters are collectively known as

character keys

65. <u>Mouse</u> is a pointing device used to control the movement of the cursor on the display screen

66. <u>Mouse</u> can be used to select icons, menus, command buttons or activate something on a computer

67.In which mouse a small ball is kept inside and touches the pad through a hole at the

bottom of the mouse – <u>Mechanical Mouse</u>

68. Which mouse uses light source instead of ball to judge the motion of the pointer-Optical

<u>mouse</u>

- 69. Optical mouse has **three** buttons
- 70. Optical mouse is less sensitive towards surface
- 71.Mechanical mouse was introduced by <u>Telefunken, German Company</u> in the year <u>02/10/1968</u>
- 72. In 1988, Richard Lyon, Steve Krish independently invented different versions of

Optical Mouse

- 73. Laser Mouse is highly sensitive and able to work on any hard surface
- 74. Computer mouse was invented and developed by **Douglas Engelbar**

75. Computer mouse was invented with the assistance of <u>Bill English</u>, during the <u>1960's</u> and was patented on <u>November 17, 1970</u>

- 76. Scanners are used to enter the information directly into the computer's memory
- 77. Scanner device works like a Xerox machine
- 78. Scanner converts printed or written information and photographs into a digital format
- 79. Finger print Scanner is a fingerprint recognition device used for computer security
- 80. Finger print Scanner uses biometric technology.
- 81. Track ball is similar to the upside- down design of the mouse
- 82. <u>Retinal Scanner</u> uses unique patterns on a person's retinal blood vessels
- 83 Light pen is a pointing device shaped like a pen and is connected to a monitor
- 84. Light pens device can draw directly onto the screen

85. **Optical Character Reader** is a device which detects characters printed or written on a paper.

86 Bar code is a pattern printed in lines of different thickness

87. Bar Code gives fast and error free entry of information into the computer.

88.QR code - Quick Response code

89. **<u>QR code</u>** is the two dimension bar code which can be read by a camera and processed to interpret the image

90. Microphone serves as a voice Input device

91. Digital camera captures images / videos directly in the digital form

92.CCD- Charged Coupled Device

93. <u>Touch screen</u> is a display device that allows the user to interact with a computer by using the finger

94. <u>**Touch screen**</u> is an alternative to a mouse or keyboard for navigating a Graphical User Interface (GUI)

95. Keyer is a device for signaling by hand, by way of pressing one or more switches

96. <u>Keyer</u> differs from a keyboard, which has "no board" but the keys are arranged in a cluster.

97. Monitor is the most commonly used output device to display the information

98. Pictures on a monitor are formed with picture elements called **PIXELS**

99. CRT -Cathode Ray Tube, LCD -Liquid Crystal Display &

LED-Light Emitting Diodes

100.VGA – Video Graphics Array

101. Video graphics card helps the keyboard to communicate with the screen

102. <u>Video graphics card</u> acts as an interface between the computer and display monitor

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

104. **Plotter** is an output device that is used to produce graphical output on papers

105. Printers are used to print the information on papers. 106.

107. Printers are divided into two main categories Impact & Non-Impact

108. Impact printers print with striking of hammers or pins on ribbon

109. Dot Matrix printers and Line matrix printers are impact printers

110. Dot matrix printer prints using a fixed number of pins or wires

111. The printing speed of Dot Matrix printers varies from <u>30 to 1550 CPS (Character Per</u>

Second)

112. Line matrix printers use a fixed print head for printing

- 113. Line printers are capable of printing much more than 1000 Lines Per Minute
- 114. Non-impact printers do not use striking mechanism for printing
- 115. Which printer use electrostatic or laser technology Non-Impact
- 116. Laser printers and Inkjet printers are non-impact printers
- 117. One of the characteristics of laser printer is their **resolution**
- 118.DPI Dots Per Inch
- 119.Laser print can print 100 pages per minute(PPM)

120. **Inkjet Printers** use colour cartridges which combined Magenta, Yellow and Cyan inks to create color tones.

- 121. The speed of Inkjet printers range from **<u>1-20 PPM (Page Per Minute)</u>**
- 122. Which printer use the technology of firing ink by heating Ink Jet printer
- 123. An **Inkjet printer** can spread millions of dots of ink at the paper every single second
- 124. Speakers produce voice output
- 125. Multimedia projectors are used to produce computer output on a big screen
- 126. An **Operating system (OS)** is a basic software that makes the computer to work.
- 127. The pre-written program in ROM, called POST (Power on Self Test)
- 128.BIOS Basic Input Output System

129.A program which transfers OS from hard disk into main memory is called <u>Bootstrap</u> <u>Loader</u>

- 130. Booting process is of two types Cold booting & Warm Booting
- 131.System starting from initial state is called Cold booting or Hard booting
- 132. When the system restarts or when Reset button is pressed, we call it Warm Booting or

<u>Soft Booting</u>

133.Examples for operating system are Linux or Windows

Two and Three Marks

1.Define Computer

"A Computer is an electronic device that takes raw data (unprocessed) as an input from the user and processes it under the control of a set of instructions (called program), produces a result (output), and saves it for future use.

2.Define Hardware and software

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

Software: Software is the set of programs or instructions

3.Define IPO cycle

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

4.Difference between data and information

Data: Data is defined as an unprocessed collection of raw facts, suitable for

communication, interpretation or processing.

Ex. 134, 16 'chennai', 'C' are data

Information:

Information is a collection of facts from which conclusions may be drawn

Ex : Chennai is the capital of Tamilnadu

5.Define Data processing

The conversion of data into information is called data processing

6.Define 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.

7.Write a note on CPU or Function of CPU

- CPU is the major component which interprets and executes software instructions.
- It also control 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 i) Control unit, ALU and Memory Unit.

8.Define ALU

- 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 promote the decision-making ability of a computer.

9.Define 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.

10.Write a note on Mechanical Mouse

- A small ball is kept inside and touches the pad through a hole at the bottom of the mouse.
- When the mouse is moved, the ball rolls.
- This movement of the ball is converted into signals and sent to the computer

11. Write a note on Optical 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

12.Define Booting

- When a computer is switched on, there is no information in its RAM.
- The pre-written program in ROM called POST (Power on Self Test) will be executed first.
- This program checks if the devices like RAM, keyboard, etc., are connected

properly and ready to operate.

- If these devices are ready, then the BIOS (Basic Input Output System) gets executed.
- This process is called Booting

13.Difference between Cold booting and Warm booting

Cold Booting:

- When the system starts from initial state i.e. it is switched on, we call it cold booting or Hard Booting.
- When the user presses the Power button, the instructions are read from the ROM to initiate the booting process.

Warm Booting:

- When the system restarts or when Reset button is pressed, we call it Warm Booting or Soft Booting.
- There are chances of data loss and system damage as the data might not have been stored properly

Five Marks

1. Explain the various generation of computers

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	n Compute 0 feet \times 3 f	ers - ENIAC , EDVA	C, UNIVAC 1 ENIAC weighed about 27 tons, and 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 General	tion Comp	uters 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 Generatio	on Comput	ers IBM 360 series, H	oneywell 6000 series
Fourth Generation	1975- O 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
29 Generation (1) Keyboard: • Keyboa	future	s input devices. d / wireless, virtua	 Parallel and Distributed computing Computers have become smarter, faster and smaller Development of robotics Natural Language Processing Is the most common acomput of every are

used today.

• The individual keys for letters, numbers and special characters are collectively known as character keys.

- 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
- 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.
- 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 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.
- The tip of the light pen contains a light-sensitive element which detects the light from the screen helps 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,
- 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.
- The Bar code reader scans the information on the bar codes transmits to the Computer for further processing.
- The 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.

3.Explain Output devices

(1) Monitor:

• Monitor is the most commonly used output device to display the information.

- 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.
- (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.
- 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,
- 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.
- 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,

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.
- Laser printers and Inkjet printers are non-impact printers.

Laser Printers

- Laser printers mostly work with technology used by photocopiers.
- It makes a laser beam scan back and forth across a drum inside the printer,
- It can produce very good quality of graphic images.
- One of the characteristics of laser printer is their resolution how many Dots per inch(DPI).
- The available resolution range around 1200 dpi
- 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.
- The speed of Inkjet printers generally range from 1-20 PPM (Page Per Minute).
- They use the technology of firing ink by heating
- 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.

4.Explain the various components of a computer



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.
- The secondary memory is used to store the data permanently.
- The Primary Memory is volatile,
- The Random Access Memory (RAM) is an example of a main memory.
- The Secondary memory is non volatile,
- Hard disk, CDROM and DVD ROM are examples of secondary memory.

Chapter - 2 Number System One Mark Questions:

1. The term data comes from the word **datum** which means a raw fact

2. The data is a fact about people, places or some objects.

3. Computer handles data in the form of '0'(Zero) and '1' (One).

4. A bit is the short form of Binary digit which can be '0' or '1'.

5.Bit is the basic unit of data in computers.

6. A nibble is a collection of 4 bits

7. A collection of 8 bits is called Byte

8. A **byte** is considered as the basic unit of measuring the memory size in the Computer

9. Word length refers to the number of bits processed by a Computer's CPU
 10. Computer memory (Main Memory and Secondary Storage) is normally

represented in terms of KiloByte (KB) or MegaByte (MB).

11. In decimal system, 1 Kilo represents 1000

12. In binary system, 1 KiloByte represents 1024 bytes

13.Yotta =2^80,Zetta=2^70, Exa=2^60, Peta=2^50,Tera=2^40,Giga=2^30 Mega=2^20,Kilo=2^10

14. Bytes are used to represent characters in a text

15.ASCII stands for American Standard Code for Information Interchange

- 16. The ASCII value for (blank space) is 32
- 17. ASCII value of numeric 0 is 48

18. ASCII values for lower case alphabets is from 97 to 122

19. ASCII values for the upper case alphabets is 65 to 90

20. A numbering system is a way of representing numbers

21. The most commonly used numbering system in real life is **Decimal number system**

22. Each number system is uniquely identified by its base value or radix

23. Radix or base is the count of number of digits in each number system

24. In the **positional number system**, each decimal digit is weighted relative to its position in the number

25. The numbers in the binary system are represented to the base 2

26. The left most bit in the binary number is called as the Most Significant Bit

27. The right most bit is the Least Significant Bit

28. Octal number system uses 8 digits

29. A hexadecimal number is represented using base **16**

30.Which number system is used to represent data in a more compact manner – **Hexadecimal Number system**

31. To convert Decimal to Binary "**Repeated Division by 2**" method can be used.

32. To convert Decimal to Octal, "**Repeated Division by 8**" method can be used.

33. To convert Decimal to Hexadecimal, "**Repeated division by 16**" method can be used

34. The method of **repeated multiplication by 2** has to be used to convert Decimal Fraction to Binary Fraction

Page 1

35. Computers can handle both **positive** (unsigned) and **negative** (signed) numbers.

36. The simplest method to represent negative binary numbers is called **Signed Magnitude**

37. In signed magnitude method, the left most bit is Most Significant Bit (MSB), is called **sign bit or parity bit**

38. In signed binary representation, the left most bit is considered as sign bit
39. 1's Complement representation is an easier approach to represent signed numbers

40. BCD – **B**inary **C**oded **D**ecimal

41. EBCDIC – Extended Binary Coded Decimal Interchange Code

42. ASCII – American Standard Code for Information Interchange

43. ISCII - Indian Standard Code for Information Interchange

44.BCD can handle 64 characters.

45. Most popular encoding system recognized by United States - **ASCII** 46.ASCII can handle **128 characters**.

47. The new edition (version) ASCII -8 can handle 256 characters

48. The ASCII code equivalent to the uppercase letter 'A' is 65

49.EBCDIC coding system is formulated by International Business Machine(IBM)

50.EBCDIC can handle 256 characters.

51. Indian Standard Code for Information Interchange is a 8-bit coding system 52.**ISCII** was formulated in the year **1986-88** and recognized by **B**ureau of Indian **S**tandards (BIS)

53. **English** and **European** Languages alone can be handled by ASCII 54. Unicode was generated to handle all the coding system of Universal languages

55.**Unicode** is a 16 bit code and can handle **65536 characters** 56. Unicode scheme is denoted by **hexadecimal numbers**

Two mark & Three marks

56.Define 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.

57.Define Binary Digit

A **bit** is the short form of **Binary digit** which can be '0' or '1'. It is the basic unit of data in computers

58.Define Word length

Word length refers to the number of bits processed by a Computer's CPU. For example, a word length can have 8 bits, 16 bits, 32 bits and 64 bits **59.What is meant by Number System?**

- A numbering system is a way of representing numbers.
- The most commonly used numbering system in real life is Decimal number system.
- Other number systems are Binary, Octal, Hexadecimal number system.
- 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.

60.Write a note on Decimal Number system

- It consists of 0,1,2,3,4,5,6,7,8,9(10 digits).
- It is the oldest and most popular number system
- In the positional number system, each decimal digit is weighted relative to its position in the number.
- This means that each digit in the number is multiplied by 10 raised to a power corresponding to that digit's position

E.g

$$(123)_{10} = 1 \times 10^2 + 2 \times 10^1 + 3 \times 10^0$$

= 100 + 20 + 3
= (123)_{10}

61.Write a note on Binary 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.
- The left most bit in the binary number is called as the Most Significant Bit (MSB) and it has the largest positional weight.
- The right most bit is the Least Significant Bit (LSB) and has the smallest positional weight.

62.Convert Binary number (1101)₂ into Decimal Number

$$(1101)_2 = 1 \times 2^3 + 1 \times 2^2 + 0 \times 2^1 + 1 \times 2^0$$

= 8 + 4 + 0 + 1

63.Write a note on octal number system

= (13)

- Octal number system uses digits 0,1,2,3,4,5,6 and 7 (8 digits).
- Each octal digit has its own positional value or weight as a power of 8.

Eg. Convert octal number into decimal equivalent

$$(547)_{8} = 5 \times 8^{2} + 4 \times 8^{1} + 7 \times 8^{0}$$
$$= 5 \times 64 + 4 \times 8 + 7 \times 1$$
$$= 320 + 32 + 7$$
$$= (359)_{10}$$

63.Write a note on Hexadecimal number system

- A hexadecimal number is represented using base 16.
- This system is used to represent data in a more compact manner.
- Since 16 symbols are used, 0 to F, the notation is called hexadecimal.
- The first 10 symbols are the same as in the decimal system, 0 to 9 and the remaining 6 symbols are taken from the first 6 letters of the alphabet sequence, A to F, where A represents 10, B is 11, C is 12, D is 13, E is 14 and F is 15.

E.g Convert Hexadecimal number into decimal number

 $(25)_{16} = 2 \times 16^{1} + 5 \times 16^{0}$ = 32+5 = (37)_{10}

Balu - SBSM

lage 3

64. How to convert Decimal number into Binary number?

- To convert Decimal to Binary "Repeated Division by 2" method can be used.
- Any Decimal number divided by 2 will leave a remainder of 0 or 1.
- Repeated division by 2 will leave a sequence of 0s and 1s that become the binary equivalent of the decimal number.
- The process is repeated until the quotient becomes 0 or 1.
- When the quotient is '0' or '1', it is the final remainder value.
- Write the final answer starting from final remainder value obtained to the first remainder value obtained

E.g Convert Decimal number (65)10 to Binary number



65.How will you convert Decimal number to octal number?

- To convert Decimal to Octal, "Repeated Division by 8" method can be used.
- We have to divide the given number by 8.

E.g Convert (65), into its equivalent Octal number

Ans: $(65)_{10} = (101)_8$

66.How will you convert Decimal to Hexadecimal number?

- To convert Decimal to Hexadecimal, "Repeated division by 16" method can be used.
- We have to divide the given number by 16.
- E.g Convert (31)₁₀ into its equivalent hexadecimal number.

67.Write the procedure for converting Decimal Fraction into Binary?

The method of **repeated multiplication by 2** has to be used

Balu - SBSM

Step 1: Multiply the decimal fraction by 2 and note the integer part. The integer part is either 0 or 1.

Step 2: Discard the integer part of the previous product.

Multiply the fractional part of the previous product by 2.

Repeat Step 1 until the same fraction repeats or terminates (0).

Step 3: The resulting integer part forms a sequence of 0s and 1s that become the binary equivalent of decimal fraction.

Step 4: The final answer is to be written from first integer part obtained till the last integer part obtained.

Eg Convert $(0.2)_{10}$ to $(?)_2$



Ans : (0.2)₁₀ = (0.00110011...)₂

68.Write the procedure for converting Binary to Decimal number

Step 1: Write down the Binary digits and list the powers of 2 from right to left(Positional Notation)

Step 2: For each positional notation written for the digit, now write the equivalent weight.

Step 3: Multiply each digit with its corresponding weight

Step 4: Add all the values.

Step 5: Add the final values.

E.g Convert (111011)₂ into its equivalent decimal number

Balu - SBSM

Page 5

Weight	32	16	8	4	2	1
Positional Notation	25	24	2 ³	2 ²	21	2º
Given number	1	1	1	0	1	1

 $32+16+8+0+2+1 = (59)_{10}$

Ans : $(111011)_2 = (59)_{10}$

69.How will you Binary number into Octal number?

Step 1: Group the given binary number into 3 bits from right to left.

Step 2: Add preceding 0 to make a group of 3 bits if the left most group has

less than 3 bits.

Step 3: Find the Octal equivalent for each group.

E.g Convert (11010110)₂ into octal equivalent number

$$\underbrace{\begin{array}{c}011\\3\\3\end{array}}_{2} \underbrace{\begin{array}{c}010\\2\end{array}}_{6} \underbrace{\begin{array}{c}110\\6\end{array}}_{6} \\ (11010110)_{2} = (326)_{8} \\ \end{array}}$$

70. How will you convert Binary to Hexadecimal number ?

Step 1: Group the given number into 4 bits from right to left.

Step 2: Add preceding 0's to make a group of 4 bits if the left most group has less than 4 bits.

Step 3: Find the Hexadecimal equivalent of each group.

Eg: Convert (1111010110)₂ into Hexadecimal number

0011	1101	0110
3	D	6
(111101	0110) ₂ =	(3D6) ₁₆

71. Write the procedure for converting Binary fraction into decimal fraction.

Step 1: Convert integral part of Binary to Decimal equivalent using positional

notation method

Balu - SBSM

Page 6

Step 2: To convert the fractional part of binary to its decimal equivalent.

Step 2.1: Write down the Binary digits in the fractional part

Step 2.2: For all the digits write powers of 2 from left to right starting

from 2^{-1} , 2^{-2} , 2^{-3} 2^{-n} , now write the equivalent weight.

Step 2.3: Multiply each digit with its corresponding weight

- Step 2.4: Add all the values which you obtained in Step 2.3
- Step 3: To get final answer write the integral part (after conversion),
- followed by a decimal point(.) and the answer arrived at Step 2.4

E.g : Convert the given Binary number (11.011)₂ into its decimal Equivalent



72. How will you convert Octal number into Decimal number?

- Write down the Octal digits and list the powers of 8 from right to left(Positional Notation)
- For each positional notation of the digit write the equivalent weight.
- Multiply each digit with its corresponding weight
- Add all the values
- E.g : Convert (1265)₈ to equivalent Decimal number

Balu - SBSM

Weight	512	64	8	1
Positional Notation	8 ³	8 ²	81	8 ⁰
Given number	1	2	6	5

$$(1265)_{8} = 512 \times 1 + 64 \times 2 + 8 \times 6 + 1 \times 5$$

= 512 + 128 + 48 + 5
(1265)_{8} = (693)_{10}

73. Convert Octal number (6213)₈ to Binary number?



74. Convert Hexadecimal into Decimal number

- Write down the Hexadecimal digits and list the powers of 16 from right to left(Positional Notation)
- For each positional notation written for the digit, now write the equivalent weight.
- Multiply each digit with its corresponding weight
- Add all the values to get one final value.
- E.g: Convert Hexadecimal (25F)₁₆ into its equivalent Decimal number

Weight	256	16	1				
Positional Notation	16 ²	16 ¹	16 ⁰				
Given number	2	5	F(15)				
$(25F)_{16} = 2 \times 256 + 5 \times 16 + 15 \times 1$ = 512 + 80 + 15 $(25F)_{16} = (607)_{10}$							

Balu - SBSM

http://www.trbtnpsc.com/2018/06/latest-plus-one-11th-study-materials-tamil-medium-english-medium-new-syllabus-based.html

75.Convert Hexadecimal (8BC)₁₆ into Binary number



76.Write a note on Sign Magnitude representation.

- The value of the whole numbers can be determined by the sign used before it.
- If the number has '+' sign or no sign it will be considered as positive.
- If the number has '-' sign it will be considered as negative.

E.g +50 or 50 is a positive number

-50 is a negative number

In signed binary representation, the left most bit is considered as sign



- If this bit is 0, it is a positive number
- if it 1, it is a negative number.
- Therefore a signed binary number has 8 bits, only 7 bits used for storing values (magnitude) and the 1 bit is used for sign.

77.Write about 1's complement representation

- This is for negative numbers only i.e. the number whose MSB is 1
- 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)

Example:

Find 1's complement for (-24)10

Given Number	Binary Number	1's Compliment
(-24) ₁₀	00011000	11100111

Balu - SBSM

Page 9

78. Write about 2's complement representation

- Invert all the bits in the binary sequence (i.e., change every 0 to1 and every 1 to 0 ie.,1's complement)
- Add 1 to the result to the Least Significant Bit (LSB).

Example:

2's Complement represent of (-24)₁₀

Binary equivalent of +24:	11000
8bit format:	00011000
1's complement:	11100111
Add 1 to LSB:	+1
2's complement of -24:	11101000

79. Binary addition :

Rules for Binary Addition:

1.				100	
	Α	В	SUM $(A + B)$	Carry	
	0	0	0	-	
	5 0 7	1		90	
		0		LD C	IJ
	1	1	0	1	

Add: 1011₂ + 1001₂

(Carr	y Bit)	\rightarrow	1	1 🗖	
		1	0	1	1
	+	1	0	0	1
	1	0	1	0	0

 $1011_2 + 1001_2 = 10100_2$

80. Perform Binary addition for the following: 23₁₀ **+ 12**₁₀ Step 1: Convert 23 and 12 into binary form

				8
16	8	4	2	1
1	0	1	1	1
	16 1	16 8 1 0	16 8 4 1 0 1	16 8 4 2 1 0 1 1

12	10			
2's power	8	4	2	1
Binary Number	1	1	0	0
$12_{10} = 000$	001	1002		

Step 2: Binary addition of 23 and 12:

Carry Bit \rightarrow			1	1			
$23_{10} = 0$	0	0	1	0	1	1	1
$12_{10} = 0$	0	0	0	1	1	0	0
$35_{10} = 0$	0	1	0	0	0	1	1

81.Binary Subtraction

Rules	for Binar	y Subtra	ction:	
V	A	В	Difference	Borrow
			(A-B)	
	0	0	0	0
	1	0	1	0
	1	1	0	0
	0	1	1	1
		17		

Example: Subtract 1001010₂ – 10100₂

1 0 0 1 0 1 0

1	0	1	0	0	

110110

Balu - SBSM

82. Perform binary addition for the following: (-21)₁₀ + (5)₁₀ Step 1: Change -21 and 5 into binary form

21,10									
2's power	16	8	4	2	1				
Binary Number	1	0	1	0	1				
$21_{10} = 0$	$21_{10} = 00010101_2$								
5 ₁₀									
2's power		4	2	1					
Binary Numb	er	1	0	1					
$5_{10} = 00000101_2$									

Step 2:

21,10	0	0	0	1	0	1	0	1
1's Compliment	1	1	1	0	1	0	1	0
2's Compliment	1	1	1	0	1	0	1	1

Step 3:

```
Binary Addition of -21 and 5:
 Carry bit
                                       1
                               1
                                   1
                                           1
 -21 10
                    1
                       1
                               0
                                   1
                                       0
                                           1
                           1
                                               1
  510
                    0
                       0
                           0
                               0
                                   0
                                       1
                                           0
                                               1
 -16<sub>10</sub> (Result)
                    1
                       1
                           1
                               1
                                   0
                                       0
                                           0
                                               0
```

83.Write a note on ASCII

- This is the most popular encoding system recognized by United States.
- This encoding system can handle English characters only.
- This can handle 2⁷ bit which means 128 characters.
- In this system, each character has individual number.
- The new edition (version) ASCII -8, has 2⁸ bits and can handle 256 characters
- They are represented from 0 to 255 unique numbers.
- The ASCII code equivalent to the uppercase letter 'A' is 65.
- The binary representation of ASCII (7 bit) value is 1000001.
- Also 01000001 in ASCII-8 bit.

Balu - SBSM

84.Write a note on EBCDIC

- This is similar to ASCII Code with 8 bit representation.
- This coding system is formulated by International Business Machine(IBM).
- The coding system can handle 256 characters.

85.Define ISCII

- ISCII is the system of handling the character of Indian local languages.
- This as a 8-bit coding system.
- Therefore it can handle 256 (2⁸) characters.
- This system is formulated by the department of Electronics in India in the year 1986- 88 and recognized by Bureau of Indian Standards (BIS).

86.Write a note on Unicode

- This coding system is used in most of the modern computers.
- The popular coding scheme after ASCII is Unicode.
- ASCII can represent only 256 characters.
- Therefore English and European Languages alone can be handled by
 - The Unicode was generated to handle all the coding system of Universal languages.
- This is 16 bit code and can handle 65536 characters.
- Unicode scheme is denoted by hexadecimal numbers.

Chapter - 3 Computer Organization One Mark Questions:

- 1. **Computer organization** deals with the hardware components of a computer System
- 2. **Computer organization** is concerned with how the various components of computer hardware operate.
- 3. **Computer organization** deals with how they are interconnected to implement an architectural specification
- 4. **Computer architecture** deals with the engineering considerations involved in designing a computer
- 5. **Computer Organization** deals with the hardware components that are transparent to the programmer
- 6.CPU is the major component of a computer, which performs all tasks.
- 7. Microprocessors were first introduced in early 1970
- 8. The first general purpose microprocessor, 4004 was developed by Intel Inc
- 9. The microprocessor is a programmable multipurpose silicon chip
- 10.Microprocessor is driven by clock pulses
- 11. The microprocessor is made up of **3** main units
- 12. Registers is also known as Internal memory
- 13. **Registers** is used to hold the instruction and data for the execution of the processor
- 14. **Microprocessor** is able to communicate with the memory units and the Input /Output devices
- 15. The system bus is a bunch of wires that serves as communication channels between the Microprocessor and other devices
- 16. Hertz –is the standard unit of measurement used for measuring frequency
- 17. One hertz equals one cycle per second
- 18. The average human ear can detect sound waves between 20 and 20,000 Hz
- 19. Sound waves close to **20 Hz** have a low pitch and are called **"bass"** frequencies
- 20. Sound waves above **5,000 Hz** have a high pitch and are called **"treble**" frequencies
- 21. A Microprocessor's performance depends on Clock speed, Instruction set and Word size
- 22. Every microprocessor has an **internal clock** that regulates the speed at which it executes instructions
- 23. The speed at which the microprocessor executes instructions is called the **clock speed**
- 24. Clock speed is measured in **MHz** (Mega Hertz) or in **GHz** (Giga Hertz)
- 25. A command which is given to a computer to perform an operation on data is called an **instruction**

S Balasubramanian –SBSM

Mobile: 9629938780

- **26.** set of machine level instructions that a microprocessor is designed to execute is called as an **instruction set**.
- **27**. The number of bits that can be processed by a processor in a single instruction is called its **word size**
- **28. Word size** determines the amount of RAM that can be accessed by a microprocessor at one time
- 29. Total number of input and output pins in turn determines the architecture of the microprocessor
- 30. Transistors used in Intel 4004 is 2300
- **31.**Size of Intel 4004 is **10 Micrometer**
- 32.Clock speed of Intel 4004 is 740 KHz
- 33.Data width of Intel 4004 processor is 4 bits
- 34.MDR Memory Data Register
- 35.MAR- Memory Address Register
- **36.** The **Memory Data Register (MDR)** keeps the data which is transferred between the Memory and the CPU
- 37.The **Program counter** is a special register in the CPU which always keeps the address of the next instruction to be executed
- 38. A **bus** is a collection of wires used for communication between the internal components of a computer
- 39. The address bus is used to point a memory location
- 40. A decoder, a digital circuit is used to point to the specific memory location
- 41. A data bus is used to transfer data between the memory and the CPU
- 42. The data bus is bidirectional and the address bus is unidirectional
- 43. The read operation fetches data from memory and transfers to MDR.
- 44. Write operation transfers data from the MDR to memory
- 45. The data bus has eight parallel wires
- 46. If R/W is 1 it means Read operation, if 0 means write operation.
- 47.Depending on width of data, Microprocessor can be classified into 4 types
- 48.RISC Reduced Instruction Set Computers
- 49.RISC have small set of highly optimized instructions
- 50. Examples of RISC processors are Pentium IV, Intel P6, AMD K6 and K7
- 51.CISC Complex Instruction Set Computers

52. Examples of CISC processors are **Intel 386 & 486, Pentium, Pentium II and III, and Motorola 68000**

53. There are **two** types of accessing methods to access (read or write) the memory

- 54. In sequential access, the memory is accessed in an orderly manner
- 55. In random access, any byte of memory can be accessed directly

56. The main memory is otherwise called as Random Access Memory

57. The smallest unit of information that can be stored in the memory is called as a **bit**.

58. RAM is a **volatile** memory

59. There are two basic types of RAM i) Dynamic RAM ii) Static RAM

60. Dynamic RAM needs to be refreshed frequently

61. Static RAM needs to be refreshed less often

62. **Read only memory** refers to special memory in a computer with prerecorded data at manufacturing time

63. ROM stores critical programs such as the program that boots the computer

64. **ROM** is called as a non-volatile memory

65. Programmable read only memory is also a **non-volatile memory**

66. **PROM burner** is used to write data to a PROM chip

67. The process of programming a PROM is called **burning the PROM**

68.In Erasable Programmable Read Only the content can be erased using **ultraviolet rays**

69.PROM – **P**rogrammable **R**ead **O**nly **M**emory

70.EPROM- Erasable Programmable Read Only Memory

71.EEPROM- Electrically Erasable Programmable Read Only Memory

72. Electrically Erasable Programmable Read Only Memory content can be erased by exposing it to an **electrical charge**

73. The cache memory is a very high speed and expensive memory

74.Response time is also known as Access time

75.**Response time** refers to how quickly the memory can respond to a read / write request.

76. Secondary storage devices serve as a supportive storage to main memory

77. Secondary storage is also called as Backup storage

78. Hard disk is a magnetic disk on which you can store data

79. **Hard disk** has the stacked arrangement of disks accessed by a pair of heads for each of the disks

80. CD-ROM is made from 1.2 millimeters thick, polycarbonate plastic material

- 81. CD data is represented as tiny indentations known as "pits"
- 82. The areas between pits are known as "lands"

83. The capacity of an ordinary CDROM is 700MB

- 84. A DVD (Digital Versatile Disc or Digital Video Disc) is an optical disc
- 85.DVD can store upto 4.7 GB of data
- 86. The 8 cm DVD has **1.5 GB** capacity
- 87. Double-layered sides are usually gold-coloured
- 88. Single-layered sides are usually silver-coloured
- 89. **Flash memory** is an electronic (solid-state) non-volatile computer storage medium
- 90. Examples for Flash memories are pendrives, memory cards
- 91. The time taken to read or write a character in memory is called access time

92. The capacity of the flash memories vary from **1 Gigabytes** (GB) to **2** Terabytes (TB).

93. **Blu-Ray Disc** is a high-density optical disc similar to DVD

94. A double-layer Blu-Ray disc can store up to **50GB** (gigabytes) of data

95. DVD uses a red laser to read and write data

96. **Blu-ray** uses a blue-violet laser to write

97. To connect the external devices **serial port** is used

98.To connect printers **Parallel port** is used

99.**USB Port** is used to connect external devices like cameras, scanners, mobile phones, external hard disks

100. USB 3.0 is the third major version of the Universal Serial Bus

101. **USB 3.0** can transfer data up to 5 Giga byte/second

102. To connect a monitor or any display device like LCD projector **VGA connector** is used

103. **PS/2 Port-**To connect mouse and keyboard to PC.

104. SCSI Port: To connect the hard disk drives and network connectors

105. High-Definition Multimedia Interface is an audio/video interface

which transfers the uncompressed video and audio data to a compatible computer monitor

Two & Three marks

1.Difference between computer organization & Computer Architecture

- Computer organization deals with the hardware components of a computer system.
- Computer architecture deals with the engineering considerations involved

in designing a computer

2.What are the main units of Microprocessor? Arithmetic and Logic unit (ALU):

To perform arithmetic and logical instructions based on computer instructions.

Control unit: To control the overall operations of the computer through signals.

Registers (Internal Memory):

They are used to hold the instruction and data for the execution of the processor.

3.Define System bus

The system bus is a bunch of wires which is the collection of address bus,

data bus and control bus that serves as communication channels between the

Microprocessor and other devices.

4.List the characteristic of microprocessor

- a) Clock speed
- b) Instruction set
- c) Word size

5.Define clock speed

- Every microprocessor has an **internal clock** that regulates the speed at which it executes instructions.
- The speed at which the microprocessor executes instructions is called the **clock speed**.
- Clock speed is measured in MHz (Mega
- Hertz) or in GHz (Giga Hertz).

6.What is meant by Instruction set?

- A command which is given to a computer to perform an operation on data is called an **instruction**.
- Basic set of machine level instructions that a microprocessor is designed to execute is called as an instruction set. Instruction performs set of operations.
 - 1. Data transfer
 - 2. Arithmetic operations
 - 3. Logical operations
 - 4. Control flow
 - 5. Input/output

7.Define word size

- The number of bits that can be processed by a processor in a single instruction is called its word size.
- Word size determines the amount of RAM that can be accessed by a microprocessor at one time
- Total number of input and output pins in turn determines the architecture of the microprocessor.

8.What is meant by Program counter?

The Program Counter (PC) is a special register in the CPU which always

keeps the address of the next instruction to be executed.

9.Define bus.

A bus is a collection of wires used for communication between the internal

S Balasubramanian –SBSM

Mobile: 9629938780

components of a computer.

10.What is meant decoder?

Decoder, a digital circuit is used to point to the specific memory location where the **word** can be located.

11.Write a note on Cache memory

- The cache memory is a very high speed and expensive memory,
- Without cache memory, every time the CPU requests the data, it has to be fetched from the main memory which will consume more time.
- It helps to achieve the fast response time, response Time, (Access Time) refers to how quickly the memory can respond to a read / write request.

Five Marks

1. Explain the different types of Microprocessors

Microprocessors can be classified based on:

- The width of data that can be processed
- The instruction set

Depending on the data width, microprocessors can process instructions.

The microprocessors can be classified as follows:

- 8-bit microprocessor
- 16-bit microprocessor
- 32-bit microprocessor
- 64-bit microprocessor

Classification based on Instruction set:

- RISC stands for Reduced Instruction Set Computers.
- They have a small set of highly optimized instructions.
- Complex instructions are also implemented using simple instructions, thus reducing the size of the instruction set.
- Examples of RISC processors are Pentium IV, Intel P6, AMD K6 and K7.

Complex Instruction Set Computers (CISC)

- CISC stands for **Complex Instruction Set Computers**.
- They support hundreds of instructions.

- It accomplish a wide variety of tasks, making them ideal for personal computers.
- Examples of CISC processors are Intel 386 & 486, Pentium, Pentium II and III, and Motorola 68000.

2.Write a note on RAM

- The main memory is otherwise called as **Random Access Memory**.
- This is available in computers in the form of Integrated Circuits (ICs).
- It is the place in a computer where the Operating System, Application
 Programs and the data are kept temporarily
- The smallest unit of information that can be stored in the memory is called as a bit.
- RAM is a volatile memory, which means that the information stored in it is not permanent.
- It allows both read and write operations.
- RAM are of two types 1) Static RAM
- These two types differ in the technology they use
- Static RAM needs to be refreshed less often, which makes it faster.
- Static RAM is more expensive than Dynamic RAM.

3.Write a note on ROM

- Read only memory refers to special memory in a computer with prerecorded data at manufacturing time which cannot be modified.
- The stored programs that start the computer and perform diagnostics are available in ROMs.
- ROM stores critical programs such as the program that boots the computer.
- Once the data has been written onto a ROM chip, it cannot be modified or removed and can only be read.
- ROM retains its contents even when the computer is turned off.
- ROM is called as a non-volatile memory.

S Balasubramanian –SBSM

2) Dynamic RAM

4.Explain the various types of ROM PROM:

- Programmable read only memory is also a non-volatile memory on which data can be written only once.
- PROM is non-volatile
- PROM is manufactured as a blank memory, whereas a ROM is rogrammed during the manufacturing process itself.
- PROM programmer or a PROM burner is used to write data to a PROM chip.
- The process of programming a PROM is called burning the PROM.

EPROM:

- Erasable Programmable Read Only Memory is a special type of memory which serves as a PROM,
- The content can be erased using ultraviolet rays.
- An EPROM differs from a PROM, PROM can be written only once and
- 7 cannot be erased.
- EPROMs are used widely in personal computers because they enable the manufacturer to change the contents of the PROM to replace with updated versions or erase the contents before the computer is delivered.

EEPROM:

- Electrically Erasable Programmable Read Only Memory can be erased by exposing it to an electrical charge.
- EEPROM is non-volatile.
- EEPROM is slower in performance.

5.Explain the various secondary storage devices

Hard disk:

- Hard disk is a magnetic disk on which you can store data.
- The hard disk has the stacked arrangement of disks accessed by a pair of heads for each of the disks.
- The hard disks come with a single or double sided disk.

Compact Disk

- A CD or CD-ROM is made from 1.2 millimeters thick, polycarbonate plastic material.
- A thin layer of aluminum or gold is applied to the surface.
- CD data is represented as tiny indentations known as "pits",
- The areas between pits are known as "lands".
- A motor within the CD player rotates the disk.
- The capacity of an ordinary CDROM is 700MB.

Digital Video Disk

- A DVD (Digital Versatile Disc or Digital Video Disc) is an optical disc
- Capable of storing up to 4.7 GB of data,
- DVDs are often used to store movies at a better quality.
- DVDs are read with a laser.
- The disc can have one or two sides, and one or two layers of data per side;
- The number of sides and layers determines how much it can hold.
- A 12 cm diameter disc with single sided, single layer has 4.7 GB capacity,
- The single sided, double layer has 8.5 GB capacity.
- The 8 cm DVD has 1.5 GB capacity.
- Double-layered sides are usually gold-coloured,
- Single-layered sides are usually silver-coloured

Flash memory devices

- Flash memory is an electronic(solid-state) non-volatile computer storage medium that can be electrically erased and reprogrammed.
- Examples for Flash memories are pendrives, memory cards etc.
- Flash memories can be used in personal computers, Personal Digital Assistants (PDA), digital audio players, digital cameras and mobile phones.
- Flash memory offers fast access times.

- The time taken to read or write a character in memory is called access time.
- The capacity of the flash memories vary from 1 Gigabytes (GB) to 2 Terabytes (TB).

Blu-ray disc

- Blu-Ray Disc is a high-density optical disc similar to DVD.
- Blu-ray disc is used for PlayStation games and for playing High-Definition (HD) movies.
- A double-layer Blu-Ray disc can store up to 50GB (gigabytes) of data.
- The format was developed to enable recording, rewriting and playback of high-definition video, as well as storing large amount of data.
- DVD uses a red laser to read and write data.
- Blu-ray uses a blue-violet laser to write.

6.Explain the various types of Ports and Interfaces

Serial Port: To connect the external devices,

Parallel Port: To connect the printers,

USB Ports: To connect external devices like cameras, scanners, mobile phones, external hard disks and printers to the computer.

USB 3.0 is the third major version of the Universal Serial Bus (USB) standard to connect computers with other electronic gadgets

USB 3.0 can transfer data up to 5 Giga byte/second.

VGA Connector: To connect a monitor or any display device like LCD projector.

Audio Plugs: To connect sound speakers, microphone and headphones.

PS/2 Port: To connect mouse and keyboard to PC.

SCSI Port: To connect the hard disk drives and network connectors.

High Definition Multimedia Interface (HDMI):

High-Definition Multimedia Interface is an audio/video interface transfers the uncompressed video and audio data from a video controller, to a compatible computer monitor, LCD projector, digital television etc.