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# COMPUTER SCIENCE 11 Constant of Constant Standard 14 Constant of Constant Standard 14 Constant of Constant Standard 14 Constant of Constant Standard 15 Constant of Constant Standard

NAME : SCHOOL:

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# UNIT I - FUNDAMENTALS OF COMPUTER AND WORKING WITH A TYPICAL OPERATING SYSTEMS (WINDOWS & LINUX)

# **CHAPTER – 1 INTRODUCTION TO COMPUTER**

#### **Choose the correct answer:**

1.	First generation computer	component	is used	
	a. Vacuum tubes	I	b. Transistors	
	c. Integrated circuits		d. Microprocessors	
2.	Name the volatile memory		1	
	a. ROM	b. PROM	c. RAM	d. EPROM
3	Identify the output device			
0.	a Keyboard	h Memory	c. Monitor	d Mouse
4	Identify the input device	o. memory		u. 1110/000
	a Printer	h Mouse	c Plotter	d Projector
5	Output devic	e is used for printing bu	uilding plan flex board	etc
5.	a Thermal printer	h Platter	a Dot matrix	, etc. d inkiet printer
6	In ATM machines, which o	<b>D. I lottel</b>	c. Dot matrix	u. mkjet printer
0.	a Touch Saroon	h sporker	a Monitor	d Drintor
7	a. Touch Screen	U. speaker	c. Wolliton	u. Printei
1.	when a system restart	which type of	booting is used.	1 D - 1 h 4
0	a. warm booting	b. Cold booting	c. Touch boot	d. Real boot.
8.	Expand POST		1 D C C	T (
	a. Post on self lest		b. Power on Software	e lest
0	c. Power on Self Test		d. Power on Self Te	ext
9.	Which one of the following	is the main memory?		
	a. ROM	b. RAM	c. Flash drive	d. Hard disk
7 70. 7	Which generation of compu	iter used IC's?	10101	
	a. First	b. Second	c. Third	d. Fourth
V11.	$\underline{ \lor  \lor  \lor}$ Example of Fi	rst Generation Comput	er. Ggl Ggl	
	a. IBM 1401	b. VLSI	c. IBM 360 Series	d. ENIAC
12.	Which of the following led	us today to extremely h	high speed calculating of	levice?
	a. Laptop b. Ta	bulating machine	c. Abacus	d. ENIAC
13.	Languages used in	Third generation Com	puter.	
	a. Machine Level		b. Object Code	
	c. High Level		d. Assembly Level	
14.	Example is no	t in First Generation C	omputer.	
	<b>a. IBM 1401</b> b. EI	DVAC	c. UNVAC1	d. ENIAC
15.	In second generation	component is use	d.	
	a. IC's b. M	croprocessor	c. Transistor	d. Vacuum tubes
16.	Example of Sec	ond Generation Compu	iter.	
	<b>a. IBM 1401</b> b. EI	OVAC	c. UNVAC	d. ENIAC
17.	is defined as	an unprocessed collecti	ion.	
	a. Datum <b>b.</b> Da	ita	c. Process	d. Project
18.	Example is no	t in Second Generation	Computer.	5
	a. IBM 1401 b. UN	VVAC1108	c. IBM 360 Series	d. UNIVA1
19.	The CPU has	components in Compu	iter.	
- / •	a. 2 b. 4		c. 3	d. 5
20	Device is used	to insert the Alpha-Nu	meric data into Compu	iter
20.	a Mouse h Pr	nter	c Monitor	d. Keyboard
21	Which of the following is a	Third generation of co	mnuter?	a. Ity sould
<i>4</i> 1.	a IBM1620	h FN	IIAC	
	c UNIVAC1	d <b>H</b> o	nevwell 6000 series	
22	memory is a Vol	u. 110 atile		
<i>LL</i> .	a <b>Primary</b> h DD	$\Omega \cap M$	c Secondary	d ROM
	a. I I IIIIai y 0. PK		c. Secondal y	

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23.	The con	verts any type of printe	ed or written information inclu	uding photographs
	into a digital format.			
	a. Monitor		b. Scanner	
	c. Printer		d. Digital Camera	
24.	A is a device	e for signaling by hand	, by way of pressing one or m	ore switches.
	a. Keyboard	b. Printer	c. Keyer	d. Touch Screen
25.	Pictures on a monitor	are formed with pictur	e elements called	
	a. Points	b. Dots	c. inches	d. Pixels
26.	A printer th	hat prints using a fixed	number of pins or wires.	
	a. Laser	b. Ink Jet	c. Plotter	d. Dot-matrix
27.	are used t	o produce computer ou	tput on a big screen.	
	a. Monitors		b. Touch Screen	
	c. Plotter		d. Multimedia Projector	
28.	An is a b	basic software that mak	es the computer to work.	
	a. Ms-Office	b. Ms-Paint	c. Operation System	d. Note Pad
29.	Booting process has	Types.		
	a. 3	b. 2	c. 5	d. 1
30.	is the ph	ysical component of a	computer.	
	a. Software	b. Application	c. Hardware	d. Power
31.	"An act of Calculatin	g" means		
	a. Computing	b. Arithmetic	c. numbers	d. calculations
32.	is the first know	wn calculating machine	e counting.	
	a. Analytical Engine		b. Abacus	
	c. Calculator		d. Computer	
33.	Super Conductors are	e used in	generation.	
	a. Fourth	b. Second	c. Fifth	d. Third
34.	Which software used	in fifth generation com	nputer? O	$\sum \sum $
. 77 77	a. Artificial Neural N	etwork	b. Artificial Intelligence	
	c. Robotics		d. Machine language	
V35.	The first generation c	omputers were used be	tween OULOUL	OL VOU
	a.1940 – 1955	b. 1941 – 1956	c. 1942 – 1955	d. 1941- 1955
36.	The first generation c	omputers used	for memory.	
	a. Magnetic circuitry		b. Magnetic drums	
	c. Magnetic tubes		d. Magnetic buses	
37.	Transistors were mad	e smaller in size and pl	aced on chips.	
	a. Integrated	b. Silicon	c. Magnetic	d. Circuit
38.	The primary memory	is in nature.	-	
	a. Peripheral	b. Volatile	c. Non- Volatile	d. Main memory
39.	The second generatio	n computers were used	between	
	a. 1954 – 1964	b. 1951 – 1966	c. 1950 – 1956	d. 1961- 1965
40.	The third generation of	computers were used be	etween	
	a. 1964 – 1975	b. 1961 – 1971	c. 1960 – 1975	d. 1964- 1975
41.	The fourth generation	computers were used	between	
	a.1975 – 1980	b. 1971 – 1981	c. 1970 – 1975	d. 1974- 1985
42.	is the major con	nponent which interpre	ts and executes software instru	uctions.
	a. Input unit	b. Output unit	c. Memory	d. CPU
43.	In Mouse use	s Laser Light.	-	
	a. Optical	b. Mechanical	c. Laser	d. Air
44.	types of ]	Printer in the categories	5.	
	a. 3	b. 2	c. 4	d.1
45.	Laser printer print	pages per minut	es.	
	a. 100	b.150	c. 80	d. 120
46.	Line printers are capa	ble of printing much m	nore than Lines Per	Minute.
	a. 1500	<b>b. 1000</b>	c. 500	d. 800

47.	is the physical component of a con	nputer.	
	<b>a. Hardware</b> b. Software	c. Application	d. Picture
48.	The speed of Inkjet printers generally range	from Pag	e Per Minute.
	a. 1-10 b. 1-15	c. 15-20	d.1-20
49.	serves as a voice Input device.		
	a. Speakers b. Scanner	c. Printer	d. Microphone
50.	is the set of programs or instruct	ions.	
	a. Hardware <b>b. Software</b>	c. Application	d. Picture
51.	The computer mouse as we know it today w	as invented and develo	ped by
	a. Douglas Engelbart b. Douglas Lee	c. Charles Babbage	d. Napier
52.	Third generation computers, used		
	a. Vacuum Tube	b. Transistor	
	c. Integrated Circuit	d. Micro Processor	
53.	When the system starts from initial state		
	a. Computing <b>b. Cold Booting</b>	c. Warm Booting	d. BIOS
54.	When the system restarts or when reset butt	on is pressed, we call it	t
	a. Computing b. Cold Booting	c. Warm Booting	d. BIOS
55.	The is the combination of hardw	vare and software.	
	a. Calculator <b>b. Computer</b>	c. ALU	d. CPU
56.	CPU interprets and executes software instru	ctions.	
	a. CPU b. ALU	c. monitor	d. mouse
57.	The processing is performed by the	1	
50	a. software b. information	c. data	d. hardware
58.	Which of the following is not a input device	? 	
50	a. Keyboard b. Mouse	c. Scanners	a. Printers
39.	Printers use color cartridges.	a Thomas 1	d Imlrin4
-60	a. Laser 0. Dot Matrix	c. Inermal	a. Inkjet
	is used to feed any round of data	o Memory Unit	I Innut Init
61	unit is used to Display the data		
01.	a Output Unit h Processing	c Memory Unit	d Input Unit
62	is used to Store the data into to t	he computer	a. input onit
•=.	a Output Unit b Processing	c. Memory Unit	d Input Unit
63	Main Memory is also called	controllion y child	a. input e int
	a. Secondary memory b. Mai	n memorv	
	c. CPU d. Cac	he memory.	
64.	Optical Mouse invented in the year		
	a. 1968 b. 1973	c. 1988	d. 1981
65.	Laser mouse has as many as buttons.	a. 4 <b>b. 3</b> c. 1	d. 2
66.	Who invented the computer mouse?		
	a. Douglas Engelbart b. Bill English	c. Apple Lisa	d. Henry Babbage
67.	Which device works like a Xerox machine?		
	a. Retinal scanner b. OCR	c. OMR	d. Scanner
68.	Which device is very safe and convenient for	or security instead of pa	assword?
	a. Scanner <b>b. Finger scanner</b>	c. Track Ball	d. Retinal scanner
69.	Which device similar to the upside – down of	design of the mouse?	
	a. Mouse b. Optical Mouse	c. Laser Mouse	d. Retinal Scanner
70.	detect alpha numeric characters pr	inted or written on a pa	per.
	a. Scanner	b. Mouse	
	c. Trace Ball	d. Optical Character	Reader
71.	Which of the following device uses CCD El	ectronic Chip?	
	a. Digital Camera b. OCR	c. MICR	d. Voice Input System
72.	Input $\rightarrow$ $\rightarrow$ Output	D	
70	a. Data b. Information	c. Process	d. Computer
73	Printers are basically classified into	types.	

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	a. 3	b. 2	c. 4	d. 5
74.	How many classifica	tion of memories in me	emory unit?	
	a. 2	b. 4	c.5	d. more than 2
75.	How many types of k	keyboards used to input	t the data? a. 2	b. 4 c. 3 d. 5
76.	Which of the followi	ng Mouse type used G	reen LED?	
	a. Mechanical	b. Optical	c. Laser	d. None of those
77.	Which of the followi	ng Mouse type used In	frared LED?	
	a. Mechanical	b. Optical	c. Laser	d. None of those
78.	Which mouse has as	many as 12 buttons?		
	a. Laser	b. Optical	c. Mechanical	d. Both a & b
79.	The mechanical mou	se introduced in the ye	ar.	
	a. 1978	b.1988	c. 1968	d. 1958
80.	The first computer M	Ionitor was released in	the year	
	a. 1974	b. 1972	c. 1971	d. 1973
81.	Which of the followi	ng is an impact printer	?	
	a. Inkjet	b. Fax	c. Dot Matrix	d. Laser
82.	How many buses ava	ilable inside the CPU?	a. 4 <b>b. 3</b> c. 2	d. many
83.	In which bus the data	a can travel in single di	rection?	
	a. Address bus	b. Data Bus	c. Control Bus	d. Universal Bus

#### **ABBREVIATION:**

ALU Arithmetic Logic Unit CPU Central Processing Unit CU Control Unit \_ IC **Integrated Circuits** GUI Graphical User Interface Very Large Scale Integrated Circuits. VLSI/-Ultra Large Scale Integration ULSI -ENIAC-Electronic Numerical Integrator And Calculator NLP Natural Language Processing -Artificial Intelligence AI \_ RAM – Random Access Memory ROM -Read Only Memory QR Quick Response OCR Optical Character Reader 4 \_ CCD Charge Coupled Device -CRT Cathode Ray Tube -LCD Liquid Crystal Display -Light Emitting Diode 🗕 LED -VGA -Video Graphics Array CPS -Character Per Second PIXEL-**Picture Element** CPS Character Per Second -DPI Dots Per Inch 4 -PPM -Page Per Minute 4 POST -Power on Self Test 🖌 BIOS -Basic Input Output System 🖌 OS Operating system

#### **Question and Answer:**

#### 1. 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.

#### 2. 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.

#### 3. 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.

#### 4. Write the Generation of Computer.

<b>First Generation</b>	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)
<b>Fifth Generation</b>	1980 - till date	Ultra Large Scale Integration (ULSI)
Sixth Generation	In future	

# 5. 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.

#### 6. 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.

#### 7. 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.

#### 8. 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.

#### 9. 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.

#### 10. Write the Components of a Computer.

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

#### 11. 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.

#### 12. 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.

#### 13. 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.

#### 14. 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.

#### 15. 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.

#### 16. 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.

#### 17. 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.

#### 18. List out the Types of Output Devices.

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

#### 19. Difference between Optical and Laser Mouse

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

# 20. 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.

#### Answer the Detail Question:

#### 1. Explain the Generation of Computer

Generation	Period	Main Component used	Merits/Demerits
			• Big in size
First	1942-	Vaauum tubas	• Consumed more power
Generation	1955	v acuum tubes	• Malfunction due to overheat
			<ul> <li>Machine Language was used</li> </ul>
First Generation	n Compute	ers - ENIAC, EDVA	C, UNIVAC 1 ENIAC weighed about 27 tons,
size 8 feet $\times$ 100 feet $\times$ 3 feet and consumed around 150 watts of power			
			• Smaller compared to First Generation
			• Generated Less Heat
	1955- 1964 <b>Transistors</b>		• Consumed less power compared to first
Second		Transistors	generation
Generation		54 <b>Transistors</b>	• 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 Generat	tion Comp	uters IBM 1401, IBM	1620, UNIVAC 1108
Third Generation	1964 -1975	Integrated Circuits (IC)	<ul> <li>Computers were smaller, faster and more reliable</li> <li>Consumed less power</li> <li>High Level Languages were used</li> </ul>
Third Generation	on Comput	ers IBM 360 series, H	oneywell 6000 series
		Microprocessor	• Smaller and Faster
Fourth	1975-	Very Large Scale	• Microcomputer series such as IBM and
Generation	1980	Integrated Circuits	APPLE were developed
		(VLSI)	Portable Computers were introduced.
Fifth Generation	1980 - till date	Ultra Large Scale Integration (ULSI)	<ul> <li>Parallel Processing</li> <li>Super conductors</li> <li>Computers size was drastically reduced.</li> <li>Can recognize Images and Graphics</li> <li>Introduction of Artificial Intelligence and Expert Systems</li> <li>Able to solve high complex problems including decision making and logical reasoning</li> </ul>
Sixth Generation	In future	Dad	<ul> <li>Parallel and Distributed computing</li> <li>Computers have become smarter, faster and smaller</li> <li>Development of robotics</li> <li>Natural Language Processing</li> <li>Development of Voice Recognition Software</li> </ul>

## 2. 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.

#### 3. 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.

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.

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# **CHAPTER -2 NUMBER SYSTEM**

# PART - I

#### **Choose the Correct Answer:**

1.	Which refers to the nu	umber of bits processe	d by a computer's CPU?	
	A) Byte	B) Nibble	C) Word length	D) Bit
2.	How many bytes does	s 1 Kilo Byte contain?		
	A) 1000	B) 8	C) 4	D) 1024
3.	Expansion for ASCII	,	,	,
	A) American School	Code for Information I	nterchange	
	<b>B</b> ) American Standa	rd Code for Informa	tion Interchange	
	C) All Standard Code	for Information Interc	change	
	D) American Society	Code for Information	Interchange	
4.	$2^{50}$ is referred as		e	
	A) Kilo	B) Tera	C) Peta	D) Zeta
5.	How many characters	s can be handled in Bir	arv Coded Decimal System?	)
	A) 64	B) 255	C) 256	D) 128
6	For 11012 what is the	Hexadecimal equival	ent?	_)
	A) F	B) E	C) D	D) B
7	What is the 1's comp	lement of 00100110?	-,-	_)_
<i>,</i> .	A) 00100110	B) 11011001	C) 11010001	D) 00101001
8	Which amongst this is	s not an octal number?	0) 11010001	2) 00101001
0.	A) 645	B) 234	C) 876	D) 123
9	The term data comes	from the word	0)010	D) 120
).	A) Datum	B) Digit	C) Datam	D) Dateum
	$-A \longrightarrow is a collect$	tion of 4 bits		
	A)Byte	B) Boolean		D) Nibble
	The most commonly	used numbering syster	n is the system	
· · · · ·	A) Binary	B) Decimal	C) Octal	D) Hexadecimal
12	A is small piec	e of data that is derive	d from the words "BInary Dig	viT"
	A) Byte	B) BIT	C) Kilo Byte	D) Mega Byte
13.	A collection of 8 bits	is called as a		_) =======
10.	A) Byte	B) KB	$\overline{C}$ ) Bit	D) MB
14	have only two n	ossible values 0 and 1	0)210	2) 112
	$\overline{A}$ ) Byte	B) KB	C) BIT	D) MB
15	The most commonly	used coding scheme	0)211	2) 112
10.	A) BCD	B) ASCII	C) EBCID	D) ISCII
16	The left most bit in th	e binary number is cal	led as	D) ISEN
10.	A) LSB	B) SLB	C) MSB	D) LMB
17	The right most hit in t	the hinary number is c	alled as	D) LIND
17.	A) LSR	B) SLB	C) MSB	D) LMB
18	The ASCII value for :	a Blank character is	C) 105D	D) LNID
10.	A) 8	B) 16	<u> </u>	D) 64
19	The ASCII value rand	b) To	nhabets is	D) 01
17.	A) $0 - 48$	B) 97 to $122$	C) 0 - 127	D) 65 to 90
20	The radix of an Binar	v number is	0) 0 127	D) 00 10 70
20.	A) 2	B) 8	$\overline{\mathbf{C}}$	D) 16
21	The radix of an octal	number is		D) 10
<i>2</i> 1.	$\Delta$ ) 2	<b>B) 8</b>	$\overline{\mathbf{C}}$	D) 16
22	The radix of an Decir	nal number is		D) 10
<i></i> .	(A) ?	R) 8	<u> </u>	D) 16
23	The radix of an Heve	decimal number is	<i>Cj</i> 10	<i>DJ</i> <sup>10</sup>
<i>4J</i> .	(A) 2	R) 8	$\overline{()}4$	D) 16
	· • <i>) 4</i>	<b>D</b> , U	$\sim_{j}$	w j 10

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24	How the information entered into com	nuter?	
24.	A) knowledge <b>B) Data</b>	C) ASCII value	D) BCD
25	Data means a		D) DCD
20.	A) Set of Information B) Set of Record	d C) Set of Values	D) Set of Files
26.	Singular form of Data		2) 500 01 1 105
	A) Record B) File	C) Values	D) Datum
27.	How the messages represented in com	puters?	,
	A) Information B) Data	C) Knowledge	D) All of these
28.	In a computer, a data is converted into	·	
	A) ASCII form B) BCD form	C) Binary form	D) Octal form
29.	4 Bits =		
20	A) Bit B) Byte	C) Word	D) Nibble
30.	Which is used to measure the number (	of bits in each word?	$\mathbf{D}$ ) $\mathbf{W} = 10^{\circ}$
21	A) word Length B) Length	C) Size	D) word Size
51.	A word can have a length of $A \ge 5.10$ bits D 15.25.50 bits	 C) 16 32 64 bits	D) 12 24 48 hits
32	A $2, 5, 10$ Ults $B$ $13, 23, 50$ Ults $B$ $13, 23, 50$ Ults Who coined the term byte?	C) 10,52,04 Dits	D) 12,24,40 UIIS
52.	A) Charles Babbage	B) John Von Newmann	
	C) Werner Buchholz	D) Herman Helirith	
33.	A number system can be derived from	a	
	A) bit B) byte	C) base or radix	D)nibble or word
34.	How many standard number system ar	e there to use?	,
	A) 2 B) 4	C) 8	D) 16
35.	Which of the following is not a standard	rd number system?	
	A) Pentagon B) Hexadecimal	C) Decimal	D) Binary
36.	The Radix of Hexadecimal is		
	A) 6 B) 10	<b>C) 16</b> O	D) 8
37.7	Which digit is not allowed in Hexadec	nnal number system?	
	A) G B) B		
V 38.	The decimal value of $1010.01_2$ is $2$		
30	A) 10.5 <b>D) 10.25</b> In binary numbers, the signed positive	C) 10.05 number has a prefix?	D) 10.025
59.	$(\Delta) + (\Delta) $	C) 1	D) –
40	In binary numbers the signed negative	e number has a prefix?	D)
10.	A) + $B$ ) 0	C) 1	D) –
41.	The 4 bit binary equivalent of -5 is	- /	)
	A) 1101 B) 0101	C) 1100	D) -101
42.	A Latin prefix Deci means		,
	A) 2 B) 8	C) 16	D) 10
43.	How many procedures are there to con	wert from decimal to binary?	
	A) 2 B) 4	C) 8	D) 3
44.	The most commonly used number syst	iem is	$\mathbf{D} = \mathbf{D}$
45	A) Binary B) Hexadecimal	C) Decimal	D) Octal
45.	BCD IS DIt code.	$\mathbf{C}$	D) 2
16	Which coding scheme is used to LCD?	C)4	D) 2
40.	A) Unicode B) ASCII	C) FBCDIC	D) BCD
47	Enhanced BCD is bit code	C) EDEDIC	DJDCD
• / •	A) 2 B) 4	C) 6	D) 8
48.	EBCDIC primarily used in Comp	outers.	) -
	A) IBM B) APPLE	C) PENTUM	D) LAPTOP
49.	EBCDIC uses bit coding scheme	·.	
	A) 16 B) 8	C) 4	D) 2
50.	The Total number of characters coded	using EBCDIC is	
	A) 32 B) 64	C) 128	D) 256

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51	Which a fall of the manual concert in disid	-	
51.	which of the following the newest concept in digit	al coding?	$\mathbf{D}$ $\mathbf{D}$ $(\mathbf{C}, 1)$
50	A) ASCII B) Unicode	C) EBCDIC	D) Byte Code
52.	Unicode is a bit code.	() 1(	D) 22
50	A) 8 B) 4 $(5000)$	C) 16	D) 32
53.	A) Data and a D) Diversion of the	S!	D) U
51	A) Byte code B) Binary code	C) EBCDIC	D) Unicode
54.	A) United to a D) A SCU		
<i></i>	A) Unicode B) ASCII Which of the uncommuned Unicode?	C) EBCDIC	D) BCD
55.	A) C B) C L	C) Iana	D) Nore of these
56	A) C D) $C^{++}$	C) Java	D) None of these
30.	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	(1) 0 1795	D) 0.5
57	A) $0.0875$ <b>D) <math>0.1875</math></b> 1's complement of 1001 is	C) 0.1785	D) 0.5
57.	$\begin{array}{c} 1 & \text{S complement of } 1001_2 \text{ is } \\ \hline \\ 1 & \text{O}1_2 \\ $	(C) 0110	D) 1010.
58	A) 10012 <b>B) 01112</b> The most nonular way of representing negative nu	C) 01102 mbers in computer systemeter	$D$ $1010_2$
56.	A) 1's Complement B) Signed Bit	C 2's Complement	D) All of these
59	Which complement performs the logical negation	on each individual bit?	D) All of these
57.	A) Signed B) Unsigned	() 2's	D) 1's
60	The 2's complement of 1101 <sub>2</sub> is	C) 2 3	D) 1 3
00.	A) 11002 B) 10102	C) 01012	D) 00112
61	The 2's complement of $1100_2$ is	c) 01012	D) 00112
01.	A) 11102 B) 01002	$C) 0101_{2}$	D) $0011_{2}$
62	$10_2 + 10_2 =$	C) 01012	D) 00112
02.	A) $100_2$ B) $20_2$	C) 1102	D) $10_2$
63.	The ASCII value of put Zero (0) is	$c)$ $110_2$	D) 102
001	A) 48 B) 58	C) 65	D) 30
63.	ISCII has been used by	51 0	$\sim$
2 2 2 2	A) IBM	C) Microsoft	<b>D) A &amp; B</b>
64.	TSCII is Proposed by		
V V	A) IWG – $TSC \circ \overline{B}$ Apple		D) Microsoft
65.	Entire Tamil alphabets handled by the coding Sche	emes .	,
	A) EBCDIC B) ASCII	C) ISCII	D) TSCII
66.	The Tamil alphabets have		
	A) Soup B) Grantha	C) Numerals	D) All of those
67.	The number of Tamil glyphs is about		
	A) 255 B) 128	C) 170	D) 256
68.	Which indicates whether the given value is positiv	e or negative?	
	A) Signed bit	B) Unsigned bit	
	C) 1's Complement	D) 2's Complement	
69.	16° is equivalent to value.		
	A) 0 B) 1	C) 16	D) A & B
70.	In Hexadecimal number system B represents the di	igit.	
- 1	A) 11 B) 12	C) 14	D) 13
71.	The Binary equivalent of Hexadecimal value C is i	repressed by	D) 1100
70	A) $1010$ B) $1011$	C) 1101	D) 1100
12.	The Hexadecimal equivalent of 1011 is	C) 11	D) 15
72	A) 14 B) 13		D) 15
13.	which of the following is not a parameter to find t	D) Desitional V-1-	ber !
	A) AUSOIULE VALUE	D) Number Strater	
74	U) Dase Value	D) Number System	
/4.	now many parameters are considered to find the m	C) 2	D) 5
75	AJJ DJ4 Which of the following idea babind positional aver	UJ2	5 (0
15.	A) Absolute Value - B) Place volume	C) Radiv	D) All of these
			D / MI OI WESC

#### **ABBREVIATION:**

- BCD Binary Coded Decimal.
- EBCDIC Extended Binary Coded Decimal Interchange Code.
- ASCII American Standard Code for Information Interchange.
- **ISCII** Indian Standard Code for Information Interchange.
- **4** TSCII Tamil Standard Code for Information Interchange.
- ↓ LSB- Least Significant Bit.
- 🖶 IBM International Business Machine.

#### **Question and Answer:**

#### 1. 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.

#### 2. 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)

#### 3. We cannot find 1's complement for (28)<sub>10</sub>. State reason.

It's a positive number. I's complements apply only with negative number.



#### 5. 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

## 6. 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}

# 7. Convert (150)<sub>10</sub> into Binary, then convert that Binary number to Octal.



# 8. Write a short note on 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  $(2^8)$  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). Now this coding system is integrated with Unicode.

9. Add :	a) $-22_{10}+15_{10}$	b) $20_{10} + 25_{10}$
a) -2	$22_{10}+15_{10}$	
+15's	s binary value	= 1111 as 8 bit format is <b>0000 1111</b> $\rightarrow$ ans of (+15)
22's	binary value	= 10110
8 bit	format	= 0001 0110
1's c	omplement	= 1110 1001
2's c	omplement -22	= +1
	= 1	110 1010 → ans of (-22)
	1110 1010	
+	0000 1111	
	= 1111 1001 <b>→</b> final	answer
b) 20	$0_{10}+25_{10}$	
20's	binary value = 0001	0100
25's	binary value = 0001	1001
(20 +	$(-25)_{10} = (45)_{10} = 001$	01101
10 Write th	e procedure to cons	vert fractional Decimal to Rinary

#### **Conversion of fractional Decimal to Binary**

The method of **repeated multiplication by 2** has to be used to convert such kind of decimal fractions.

The steps involved in the method of **repeated multiplication by 2**:

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.

 $(0.46)_{10} = (?)_2$ 

#### 11. Convert (98.46)10 to Binary

 $(98)_{10} = (?)_2$ .46x2 = .92 = 0→LSB .92x2 = .84 = 198/2 =49 = 0 $\rightarrow$  MSB .84x2 = .6 = 149/2 =24 = 1 .64x2 = .36 = 124 / 2 = 12 = 0.36x2 = .72 = 012/2 =6 = 0.72x2=.44 = 106/2 =3 = 044x2 = 88 = 003 / 2 \₹ =1 1 .88x2=.76 = 1 01/2 0 ₹1 → LSB .76x2 = .52 = 1.52x2 = .04 = 1 $=(1100010)_{2}$  $.04x2=.08 = 0 \downarrow \rightarrow MSB$ Final Answer is  $= (01110101110)_2$  $=(1100010 + 0.01110101110)_2$ 

 $(98.46)_{10} = (1100010.0111010101110)_2$ 

12. Find 1's Complement and 2's Complement for the following Decimal number

a) -98 b) -135	
a) -98	b) -135
98's Binary value is 1100010 [find the value	135's Binary value is 10000111 [find the value
through divide by 2]	through divide by 2]
8 bit format is 0110 0010	8 bit format is 1000 0111
1's Complement 10011101	1's Complement 0111 1000
2's Complement + 1	2's Complement + 1
1001 1110 (-98)	0111 1001 (-135)

14. Subtract 1101011<sub>2</sub> - 111010<sub>2</sub>

13. Add 1101010<sub>2</sub>+101101<sub>2</sub>

1101010		1101011	
(+)_0101101		(-) 0111010	
10010111	$=(10010111)_{2}$	0110001	$=(0110001)_{2}$
	()2		(**********)2

#### PART - II **BOOLEAN ALGEBRA**

#### **Choose the correct answer :**

1.	Which is a basic elec	tronic circuit w	hich op	perates on one or more	signals?
	a) Boolean algebra	b) Gate	c) Fun	damental gates	d) Derived gates
2.	Which gate is called a	as the logical in	verter?		
	a) AND	b) OR	c) NO	Т	d)XNOR
3.	A + A =				
	a) A	b) 0	c) 1		d) A'
4.	NOR is a combination	n of ?			
	a) NOT (OR)	b) NOT(AND)	)	c) NOT(NOT)	d)NOT(NOR)
5.	NAND is called as	Gate.			
	a) Fundamental Gate	b) Derived Ga	ate	c) Logical Gate	d) Electronic Gate
6.	The sign i	is used to indica	ate the	OR operator.	
	a) (+) Plus	b) (-) minus		c) ( / ) Slash	d) ( . ) Dot
7.	The sign is used	l to indicate the	AND o	operator	
	a) (+) Plus	b) (-) minus		c) ( / ) Slash	d) ( . ) Dot
8.	NAND is a combination	ion of ?			
	a) NOT (OR)	b) NOT(AND	)	c) NOT(NOT)	d)NOT(NOR)

#### **Answer the Following :**

#### 1. What is Boolean Algebra?

Boolean algebra is a mathematical discipline that is used for designing digital circuits in a digital computer. It describes the relation between inputs and outputs of a digital circuit. The name Boolean algebra has been given in honor of an English mathematician George Boole who proposed the basic principles of this algebra.

#### 2. Write a short note on NAND gate.

The NAND gate operates an AND gate followed by a NOT gate. It acts in the manner of the followed inversion. logical operation "AND" by The output is "false" if both inputs are "true", otherwise, the output is "true". In other words the output of the NAND gate is 0 if and only if both the inputs are 1, otherwise the output is 1.

#### 3. Draw the Truth Table for XOR gate.

In Boolean algebra (Exclusive - OR) operator  $\bigoplus$  or "encircled plus". Hence C = A  $\bigoplus$ B. The Truth Table for XOR gate is

Inj	out	Output
А	В	С
0	0	0
0	1	1
1	0	1
1	1	0

#### 4. Write the Associative Laws?

Associative Law A+(B+C) = (A+B)+CA.(B.C) = (A.B).C

The logical symbol of XOR gate is



# 5. What are derived gates?

The logic gates like NAND, NOR, XOR and XNOR are derived gates which are derived from the fundamental gates.

#### 6. Write the truth table of fundamental gates.

The AND, OR & NOT are fundamental gates.

Logical Gates	Symbol	Truth Table		
		Α	В	AB
		0	0	0
AND		0	1	0
		1	0	0
		1	1	1
		Α	В	A + B
		0	0	0
OR		0	1	1
		1	0	1
		1	1	1
			A   7	<u>a</u>
NOT			<b>0</b> 1	1
			1   (	o

#### 7. Write a short note on XNOR gate.

The XNOR (exclusive - NOR) gate is a combination XOR gate followed by an inverter. Its output is "true" if the inputs are the same, and "false" if the inputs are different. In simple words, the output is 1 if the input are the same, otherwise the output is 0.

#### The truth table for AND Gate is

5	1 0	5\ 5/	2
	put 🚽	Output	$\square$
	B	С	
DOU	LCOL	0 2	
0	1	0	
1	0	0	
1	1	1	

#### 8. Reason out why the NAND an NOR are called universal gates?

NAND and NOR gates are called Universal gates, because the fundamental logical gates can be realized through them.

#### 9. Write the De Morgan's law.

#### De Morgan's

$$\frac{\overline{A + B}}{\overline{A + B}} = \overline{A} \cdot \overline{B}$$
$$\overline{(A \cdot B)} = \overline{A} + \overline{B}$$

#### Explain in Detail:

1. Explain the fundamental gates with expression and truth table.

#### AND Gate

The AND gate can have two or more input signals and produce an output signal. The output is "true" only when both inputs are "true", otherwise, the output is "false". In other words the output will be 1 if and only if both inputs are 1; otherwise the output is 0. The output of the AND gate is represented by available say C, where A and B are two and if input Boolean variables. In Boolean algebra, a variable can take either of the values '0' or '1'. The logical symbol of the AND gate is

One way to symbolize the action of an AND gate is by writing the Boolean function.

#### C = A AND B

In Boolean algebra the multiplication sign stands for the AND operation. Therefore, the output of the AND gate is

C = A. B or simply C = ABRead this as "C equals A AND B".

Since there are two input variables here, the truth table has four entries, because there are four possible inputs : 00, 01, 10 and 11.

For instance if both inputs are 0,

 $C = A \cdot B$  $= 0 \cdot 0$ = 0



#### **OR** Gate

The OR gate gets its name from its behavior like the logical inclusive "OR". The output is "true" if either or both of the inputs are "true". If both inputs are "false" then the output is "false". In other words the output will be 1 if and only if one or both inputs are 1; otherwise, the output is 0.

The Logical symbol of the OR gate is

The Truth Table for OR gate is



#### **NOT Gate**

The NOT gate, called a logical inverter, has only one input. It reverses the logical state. In other words the output C is always the complement of the input. The Logical Symbol of the NOT gate is



The Truth Table of NOT gate is

Input	Output
А	C
1	0
0	1

The Boolean function of NOT gate is C = NOT AIn Boolean Algebra, the Over bar stands for NOT operation. Therefore, C = ARead this as "C equals NOT A" or "C equals The complement of A". If A is 0, C = 0 = 1On the other hand, if A is 1, C = 1 = 0 2. How AND and OR can be realized using NAND and NOR gates.

AND and OR operation from NAND gates are shown below:



**OR** operation



A+B = (A NAND A) NAND (B NAND B)

AND and OR operation from NOR gates are shown below:



**OR** operation



A+B = (A NOR B) NOR (A NOR B)

#### **3.** Explain the Derived gates with expression and truth table.

#### **NOR Gate**

The NOR gate circuit is an OR gate followed by an an inverter. Its output is "true" if both inputs are "false" Otherwise, the output is "false". In other words, the only way to get '1' as output is to have both inputs '0'. Otherwise the output is 0. The logic circuit of the NOR gate is The Logic Symbol of NOR Gate



Logic Circuit of NOR Gate

C

Logic symbol of NOR Gate

The output of NOR gate is  $C = (\overline{A + B})$ 

Read this as "C equals NOT of A OR B" or "C equals the complement of A OR B". For example, if both the inputs are 0,

$$C = (\overline{0+0}) = 0 = 1$$

#### NAND Gate

The Truth Table of NOR Gate

Input		Output
Α	В	С
0	0	1
0	1	0
1	0	0
1	1	0

#### Truth Table for NOR Gate

The NAND gate operates an AND gate followed by a NOT gate. It acts in the manner of the logical operation "AND" followed by inversion. The output is "false" if both inputs are "true", otherwise, the output is "true". In other words the output of the NAND gate is 0 if and only if both the inputs are 1, otherwise the output is 1.

The logical circuit of NAND gate is



Logic Circuit of NAND Gate

The output of the NAND gate is

C = (A, B)Read this as "C" equals NOT of A AND B" or "C" equals the complement of A AND B". For example if both the inputs are 1 C = (1, 1) = 1 = 0

Logic	Symbol	of NAND	Gate
20510	Symoor	01 1 11 11 11	Juic



Logic Symbol of NAND Gate

The truth table for NAND gate is

(In	put	Output	
A ((	В		
<u>AR<del>U</del></u> CA	9소0소		9
0	1	1	
1	0	1	
1	1	0	

Truth Table for NAND Gate

#### Theorems of **Boolean Algebra Identity** Involution $\mathbf{A} + \mathbf{0} = \mathbf{A}$ $\overline{(A)} = A$ $\mathbf{A} \cdot \mathbf{1} = \mathbf{A}$ Indempotence Complement A + A = A $\mathbf{A} + \overline{\mathbf{A}} = \mathbf{1}$ $\mathbf{A} \cdot \mathbf{A} = \mathbf{A}$ $\mathbf{A} \cdot \overline{\mathbf{A}} = \mathbf{0}$ Absorption Commutative $\mathbf{A} + (\mathbf{A} \cdot \mathbf{B}) = \mathbf{A}$ $\mathbf{A} + \mathbf{B} = \mathbf{B} + \mathbf{A}$ $\mathbf{A} \cdot (\mathbf{A} + \mathbf{B}) = \mathbf{A}$ $\mathbf{A} \cdot \mathbf{B} = \mathbf{B} \cdot \mathbf{A}$ **3rd Distributive** Associative $\mathbf{A} + \overline{\mathbf{A}} \cdot \mathbf{B} = \mathbf{A} + \mathbf{B}$ $\mathbf{A} + (\mathbf{B} + \mathbf{C}) = (\mathbf{A} + \mathbf{B}) + \mathbf{C}$ $\mathbf{A} \cdot (\mathbf{B} \cdot \mathbf{C}) = (\mathbf{A} \cdot \mathbf{B}) \cdot \mathbf{C}$

 $A \cdot (B \cdot C) = (A \cdot B) \cdot C$ butive  $A \cdot (B + C) = A \cdot B + A \cdot C$   $A + (B + C) = (A + B) \cdot (A + C)$ De Morgan's  $\overline{A + B} = \overline{A} \cdot \overline{B}$   $\overline{(A \cdot B)} = \overline{A} + \overline{B}$ 

# 4. Write the Theorems of Boolean Algebra.

Distributive

Null Element A + I = I $A \cdot 0 = 0$ 

Prepared By T.Thirumalai, M.Sc(CS).,B.Ed., Cell: 9750827717 23 | P a g e http://www.trbtnpsc.com/2018/06/latest-plus-one-11th-study-materials-tamil-medium-english-medium-new-syllabus-based.html

#### 5. Draw the Logic Gates with Corresponding Truth Tables.

Logic Gates and their corresponding Truth Tables

Logical Gates	Symbol	]	Fruth Tabl	e
		Α	В	AB
		0	0	0
AND	)	0	1	0
		1	0	0
		1	1	1
		Α	В	A + B
		0	0	0
OR	) )	0	1	1
		1	0	1
		1	1	1
	$\sim$		A   7	<b>T</b>
NOT			0 1	L
			1   0	
		A	В	AB
		0	0	1
NAND	)o	0	1	1
		1	0	1
		1	1	0
		A	В	$\overline{A + B}$
		0	0	1
NOR		0	1	0
		1	0	0
		1	1	0
		Α	В	A⊕B
		0	0	0
XOR		0	10	
ז זר זר זר ז			0	1
		1	1	0
	0 2L GLGLGLD		B	О <del>А⊕В</del> ∖
	-11-	0	0	1
XNOR	)) >>	0	1	0
		1	0	0
		1	1	1

#### **Extra Question and Answers:**

- 1. List the types of Information stored in a computer. Numbers, Text, Graphics, Animation, Audio, Video etc...
- 2. Name the Number System is used in General. Decimal Number is the Number System is used in General.
- **3.** Write the Types of Number System and its radix (basic value). There are Four types of Number System.

	Types		Rac	dix	(bas	sic va	alue)
В	inary Number				2		
0	ctal Numbers				8		
D	ecimal Numbers				10		
Η	exadecimal Numbers				16		
		1	11	1	D		-

The above number systems are also called as Positional value System.

#### 4. How the given messages are represented in computer?

The given messages are represented in computer as Information  $\rightarrow$  Data  $\rightarrow$  Knowledge.

#### 5. What is Information?

The Information is a set of processed data.

#### 6. What is Knowledge? Give example.

Knowledge is identified for the information. Ex: 50% of work done in Computer by CPU.

#### 7. How the data classified based on their size?

Bits, Nibbles, Bytes and Word.

#### 8. What is Bit?

The most basic unit of information in a digital computer is called as a Bit. A bit is Binary digit which can be 0 or 1.

#### 9. What is Byte?

Byte is a group of 8 bits which is used to represent a character. A byte is considered as the basic unit of measuring the memory size in the computer.

#### 10. What is Nibble?

A Nibble is half byte. Which is usually a grouping of 4 bits. Word is the number of bits a processor can bundle (read / write) a time.

#### 11. What is Word Length?

The term word length is used as the measure of the number of bits in each word. For example: A word can have a length of 16 bits, 32 bits and 64 bits.

# 12. Which parameters are used to determine the magnitude of a number or the value of each digit in a number?

- o Absolute value
- o/ Place Value or positional value
- Base value •

#### 13. How many procedures for converting from decimal to binary? What are they?

There are two procedures for converting from decimal to binary. They are: a) Expansion Method b) Repeated division by 2.

#### 14. What is double dabble method?

The conversion of decimal number into the binary using Repeated-division method is called double dabble method.

#### 15. Convert 101101<sub>2</sub> to its decimal equivalents using double dabble method.

The Left Most Bit ( LMB ):1

Multiply by 2,	add next bit	(2x1)+0	= 2.	
Multiply by 2,	add next bit	(2x0)+1	= 5.	
Multiply by 2,	add next bit	(2x5)+1	= 11.	
Multiply by 2,	add next bit	(2x11)+0	= 22.	
Multiply by 2,	add next bit	(2x22)+1	= 45.	$(101101)_2 = 45_{10}$

#### 16. How the binary number represented by signed and unsigned bit?

In Binary, a negative number may be represented by prefixing a digit 1 to the number while number while a positive number may be represented by prefixing a digit 0.

#### 17. What does the complement of a number refer?

The term complement refers to part which together with another makes up a whole. The 1's complement performs the logical negation on each individual bit.

**18.** Write the 1's complement of 1010<sub>2</sub> and 100101<sub>2</sub>?

1's Complement of  $1010_2$  is  $0101_2$  (replace 1 by 0 and 0 by 1) 1's Complement of 100101<sub>2</sub> is 011010<sub>2</sub>.

# 19. What is use of coding scheme?

The coding scheme is used to represent a character in the bit.

20. If a user types 256 (in Decimal) using BCD coding. What is the number stored in memory of the computer? The number stored as 0010010110.

# 21. Convert 1010100.011<sub>2</sub> to decimal number.

1010100.0112

 $= 1 \times 2^{6} + 0 \times 2^{5} + 1 \times 2^{4} + 0 \times 2^{3} + 1 \times 2^{2} + 0 \times 2^{1} + 0 \times 2^{0} + 0 \times 2^{-1} + 1 \times 2^{-2} + 1 \times 2^{-3}$ = 64 + 0 + 16 + 0 + 4 + 0 + 0 + 0 + 0.25 + 0.125 $= 84.325_{10}$ .

**22.** Convert **22.25**<sub>10</sub> to binary.

Integer part **Fractional part** 22/2 = 11 = 0 $0.25 \ge 2 = 0.50$ 0 11/2 = 05 = 1 $0.50 \ge 2 = 1.00$ 1 05/2 = 02 = 102/2 = 01 = 0

 $= 10110.01_{2}$ 

23. Convert 11011/101011102 to Hexadecimal number.

110111101011102

Group in fours 0011 0111 1010 1110 Convert each number 3 7 А Ε  $= 37AE_{16}$ .

24. Convert 4A8C<sub>16</sub> to binary.

С А 8 4 0100 1010 1000 1100 Convert each Digit  $= 0100101010001100_2.$ 

25. Convert  $(128)_8 \rightarrow (?)_{10}$  $(128)_8$  $(128)_8 = 1x8^2 + 2x8^1 + 8x8^0$ = 64 + 16 + 8 $= 88_{10}$ 

#### **Explain in Detail:**

#### 1. What is number system? Describe different number system in detail.

A numbering system is a way of representing numbers. Each number system is uniquely identified by its **base value** or **radix**.

#### **Decimal Number System**

- The term Decimal is derived from a Latin prefix Deci, which means ten.
- It consists of 0,1,2,3,4,5,6,7,8,9(10 digits).
- It is the oldest and most popular number system used in our day to day life.
- 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.

#### **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.
- 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.

#### **Octal Number System**

- The octal number system is playing a vital role in digital computer work.
- Octal number system has base of 8.
- Octal number system uses digits 0,1,2,3,4,5,6 and 7 (8 digits).

#### Hexadecimal Number System

- A hexadecimal number is represented using base 16.
- Hexadecimal or Hex numbers are used as a shorthand form of binary sequence.
- This system is used to represent data in a more compact manner.
- It has 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.

#### 2. Explain the following terms

#### i) BCD ii) EBCDIC iii) ASCII iv) ISCII v) Unicode

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.

#### i) Binary Coded Decimal (BCD)

This encoding system is not in the practice right now. This is  $2_6$  bit encoding system. This can handle  $2_6 = 64$  characters only.

# ii) American Standard Code for Information Interchange (ASCII)

This is the most popular encoding system recognized by United States. Most of the computers use this system. Remember 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 (Refer **Appendix**). The new edition (version) ASCII -8, has 28 bits and can handle 256 characters 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.

# iii) Extended Binary Coded Decimal Interchange Code (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. The input code in ASCII can be converted to EBCDIC system and vice - versa.

# iv) Indian Standard Code for Information Interchange (ISCII)

ISCII is the system of handling the character of Indian local languages. This as a 8bit 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). Now this coding system is integrated with Unicode.

# v) 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 ASCII. Particularly there was a situation, when the languages like Tamil, Malayalam, Kannada and Telugu could not be represented by ASCII. Hence, 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 ORGANIZATIONS**

**Choose the correct Answer:** 1. Which of the following is said to be the brain of a computer? a) Input devices b) Output devices c) Memory device d) Microprocessor 2. Which of the following is not the part of the microprocessor unit? a) ALU b) Control unit c) Cache memory d) Register 3. How many bits constitute a word? a) 8 b) 16 c) 32 d) determined by the processor used 4. Which of the following device identifies the location when address is placed in the memory address register? c) decoder a) Locator b) encoder d) multiplexer 5. Which of the following is a CISC processor? b) AMD K6 a) Intel P6 c) Pentium III d) Pentium IV 6. Which is the faster memory? b) Main memory a) Hard disk c) Cache memory d) Blue Ray disc 7. How many memory locations are identified by a processor with 8 bits address bus at a time? a) 28 b) 1024 c) 256 d) 8000 8. What is the capacity of 12cm diameter DVD with single sided and single layer? b) 5.5GB c) 7.8GB d) 7.2GB a) 4.7GB 9. What is the smallest size of data represented in a CD? a) blocks b) sectors c) pits d) tracks 10. Display devices are connected to the computer through a) USB port b) PS / 2 port c) SCSI port d) VGA connector 11. Which of the is not included in computer organization? a) I / O devices b) Software c) CPU d) Main memory 12. Which of the following deals with the hardware components of a computer system? a) Application software b) Computer architecture c) Computer Organization d) System software 13. Which of the following involved in designing a computer? a) Computer Architecture b) Computer Organization c) Computer Software d) Memory 14. Which of the following performs all tasks in the computer? a) Chips b) Bus c) CPU d) I / O devices 15. Microprocessors were first introduced in the early? a) 1956 b) 1958 c) 1960 d) 1970 16. The first general purpose Microprocessor developed by b) Intel d) Microsoft a) IBM c) Apple 17. Microprocessor is driven by b) ALU a) Clock pulses c) Control unit d) Register 18. The first general purpose Microprocessor was a) 5005 **b) 4004** c) 8085 d) 8086 19. Which of the following is an integrated circuit? a) Personal computer b) Microprocessor c) INTEL d) Transistor 20. Which of the following is a programmable multipurpose silicon chip that is based on a register? a) Microprocessor b) Clock c) Address Bus d) Data bus 21. How many units the Microprocessor is made? a) 1 b) 2 c) 3 d) 4 22. Which of the following process computer instructions? b) Control Unit c) Register a) ALU d) Microprocessor 23. Which of the following control the operations through signals? a) Register b) Control Unit c) Intel d) ALU

24	Which holds the instr	uction and data for the	execution of the proce	essor?
21	a) ALL	b) Control Unit	c) Register	d) System Bus
25	System Bus is the col	lection of buse		d) System Dus
23	a) ?	<b>b) 3</b>	$\sim$	d) 6
26	a) 2 System Bus is the col	lection of	C) 4	u) 0
20	a) Address Bus	b) Data Rus	c) Control Bus	d) All of these
27	Which of the following	0) Data Dus	tion abannals between	the microprocessor and
21	dovideos?	ng act as a communica	tion channels between	the interoprocessor and
		h) Control Unit	a) Degrater	d) System Dug
20	a) ALU Havy many abanatani	b) Control Unit	c) Register	d) System Bus
28	. How many characteri	stics the microprocess	or depends on?	1) 0
20	a) $2$	<b>D) 3</b>	c) 4	d) 8
29	. Which of the followi	ng is not the character	istics of Microprocesso	or?
•	a) Clock Speed	b) Instruction set	c) Word size	d) System Bus
30	. Which of the following	ng is not the unit of Mi	croprocessor?	
	a) ALU	b) Clock speed	c) Control unit	d) Register
31	. The speed at which the	ne microprocessor exec	cutes instructions is cal	led?
	a) Clock speed	b) Clock rate	c) Clock bus	d) Clock size
32	. Clock speed is measu	red in		
	a) MHz	b) GHz	c) a & b	d) BPS
33	. Which of the following	ng regulates the speed	of the microprocessor?	
	a) Program counter	b) Instruction set	c) ALU	d) Clock
34	. One Hertz =	cycle per second.		
	a) 0	b) 1	c) 2	d) 3
35	. Which of the following	ng used to measure the	speed of computer pro	ocessors?
	a) Clock rate	b) Clock speed	c) Word size	d) Hertz
36	. Expansion of MHz is			
	a) Memory Hertz	b) Mega Hertz 🧹	c) Micro Hertz	d) Main Hertz
37	How many types of o	perations carried out o	f instruction set?	
$\langle    \rangle$	a) 5	b) 4	c) 3	d) 2
38	a) 5 . Which of the followin	b) 4 ng in turn determines a	c) 3 rchitecture of the micr	d) 2 oprocessor?
38	a) 5 . Which of the followin a) I / O pins	b) 4 ng in turn determines a b) Control flow	c) 3 rchitecture of the micro c) Data transfer	d) 2 oprocessor? d) Operations
38 39	<ul> <li>a) 5</li> <li>Which of the followin</li> <li>a) I / O pins</li> <li>Which of the followin</li> </ul>	b) 4 ng in turn determines a b) Control flow ng determines the amo	c) 3 rchitecture of the micro c) Data transfer unt of RAM accessed a	d) 2 oprocessor? d) Operations at the time?
38 39	<ul> <li>a) 5</li> <li>Which of the followin</li> <li>a) I / O pins</li> <li>Which of the followin</li> <li>a) Clock speed</li> </ul>	b) 4 ng in turn determines a b) Control flow ng determines the amo b) Word size	c) 3 rchitecture of the micro c) Data transfer unt of RAM accessed a c) Hertz	d) 2 oprocessor? d) Operations at the time? d) Data bus
38 39 40	<ul> <li>a) 5</li> <li>Which of the followin</li> <li>a) I / O pins</li> <li>Which of the followin</li> <li>a) Clock speed</li> <li>Which of the followin</li> </ul>	b) 4 ng in turn determines a b) Control flow ng determines the amo <b>b) Word size</b> ng accessed the total m	c) 3 rchitecture of the micro c) Data transfer unt of RAM accessed a c) Hertz umber of pins on the m	d) 2 oprocessor? d) Operations at the time? d) Data bus icroprocessor?
38 39 40	<ul> <li>a) 5</li> <li>Which of the followin</li> <li>a) I / O pins</li> <li>Which of the followin</li> <li>a) Clock speed</li> <li>Which of the followin</li> <li>a) Hertz</li> </ul>	b) 4 ng in turn determines a b) Control flow ng determines the amo b) Word size ng accessed the total m b) Clock speed	c) 3 rchitecture of the micro c) Data transfer unt of RAM accessed a c) Hertz umber of pins on the m c) System Bus	d) 2 oprocessor? d) Operations at the time? d) Data bus icroprocessor? d) Word Size
38 39 40 41	<ul> <li>a) 5</li> <li>Which of the followin</li> <li>a) I / O pins</li> <li>Which of the followin</li> <li>a) Clock speed</li> <li>Which of the followin</li> <li>a) Hertz</li> <li>The first commercial</li> </ul>	b) 4 ng in turn determines a b) Control flow ng determines the amo b) Word size ng accessed the total m b) Clock speed microprocessor is a	c) 3 rchitecture of the micro c) Data transfer unt of RAM accessed a c) Hertz unber of pins on the m c) System Bus bit.	d) 2 oprocessor? d) Operations at the time? d) Data bus icroprocessor? d) Word Size
38 39 40 41	<ul> <li>a) 5</li> <li>Which of the followin</li> <li>a) I / O pins</li> <li>Which of the followin</li> <li>a) Clock speed</li> <li>Which of the followin</li> <li>a) Hertz</li> <li>The first commercial</li> <li>a) 8</li> </ul>	b) 4 mg in turn determines a b) Control flow mg determines the amore b) Word size mg accessed the total me b) Clock speed microprocessor is a b) 16	c) 3 rchitecture of the micro c) Data transfer unt of RAM accessed a c) Hertz umber of pins on the m c) System Bus bit. c) 3	d) 2 oprocessor? d) Operations at the time? d) Data bus icroprocessor? d) Word Size d) 2
38 39 40 41 42	<ul> <li>a) 5</li> <li>Which of the followin</li> <li>a) I / O pins</li> <li>Which of the followin</li> <li>a) Clock speed</li> <li>Which of the followin</li> <li>a) Hertz</li> <li>The first commercial</li> <li>a) 8</li> <li>In Microprocessor the following of the following of the following of the following of the first commercial</li> </ul>	b) 4 ng in turn determines a b) Control flow ng determines the amore b) Word size ng accessed the total nu b) Clock speed microprocessor is a b) 16 total output pins is a	c) 3 rchitecture of the micro c) Data transfer unt of RAM accessed a c) Hertz umber of pins on the m c) System Bus bit. c) 3	d) 2 oprocessor? d) Operations at the time? d) Data bus icroprocessor? d) Word Size d) 2 otal input pins
38 39 40 41 42	<ul> <li>a) 5</li> <li>Which of the followin</li> <li>a) I / O pins</li> <li>Which of the followin</li> <li>a) Clock speed</li> <li>Which of the followin</li> <li>a) Hertz</li> <li>The first commercial</li> <li>a) 8</li> <li>In Microprocessor, the</li> <li>a) equal</li> </ul>	b) 4 ng in turn determines a b) Control flow ng determines the amore b) Word size ng accessed the total me b) Clock speed microprocessor is a b) 16 ne total output pins is a b) greater than	c) 3 rchitecture of the micro c) Data transfer unt of RAM accessed a c) Hertz umber of pins on the m c) System Bus bit. c) 3 lways to the t	d) 2 oprocessor? d) Operations at the time? d) Data bus icroprocessor? d) Word Size d) 2 otal input pins. d) not equal
38 39 40 41 42 43	<ul> <li>a) 5</li> <li>a) 5</li> <li>b) Which of the following</li> <li>c) A pins</li> <li>c) Which of the following</li> <li>c) Clock speed</li> <li>c) Which of the following</li> <li>c) Clock speed</li> <li>c) Which of the following</li> <li>c) Which of the f</li></ul>	b) 4 ng in turn determines a b) Control flow ng determines the amore b) Word size ng accessed the total me b) Clock speed microprocessor is a b) 16 total output pins is a b) greater than microsor use bit arc	c) 3 rehitecture of the micro c) Data transfer unt of RAM accessed a c) Hertz umber of pins on the m c) System Bus bit. c) 3 lways to the t c) less than	<ul> <li>d) 2</li> <li>oprocessor?</li> <li>d) Operations at the time?</li> <li>d) Data bus</li> <li>icroprocessor?</li> <li>d) Word Size</li> <li>d) 2</li> <li>otal input pins.</li> <li>d) not equal</li> </ul>
38 39 40 41 42 43	<ul> <li>a) 5</li> <li>Which of the followin</li> <li>a) I / O pins</li> <li>Which of the followin</li> <li>a) Clock speed</li> <li>Which of the followin</li> <li>a) Hertz</li> <li>The first commercial</li> <li>a) 8</li> <li>In Microprocessor, th</li> <li>a) equal</li> <li>The present micropro</li> <li>a) 8 or 16</li> </ul>	b) 4 ng in turn determines a b) Control flow ng determines the amor b) Word size ng accessed the total nu b) Clock speed microprocessor is a b) 16 total output pins is a b) greater than cessor use bit arco b) 4 or 8	c) 3 rchitecture of the micro c) Data transfer unt of RAM accessed a c) Hertz unber of pins on the m c) System Bus bit. c) 3 lwaysto the t c) less than chitecture. c) 32 or 64	d) 2 oprocessor? d) Operations at the time? d) Data bus icroprocessor? d) Word Size d) 2 otal input pins. d) not equal
38 39 40 41 42 43	<ul> <li>a) 5</li> <li>Which of the followin</li> <li>a) I / O pins</li> <li>Which of the followin</li> <li>a) Clock speed</li> <li>Which of the followin</li> <li>a) Hertz</li> <li>The first commercial</li> <li>a) 8</li> <li>In Microprocessor, th</li> <li>a) equal</li> <li>The present micropro</li> <li>a) 8 or 16</li> <li>How many types of B</li> </ul>	b) 4 ng in turn determines a b) Control flow ng determines the amor b) Word size ng accessed the total nu b) Clock speed microprocessor is a b) 16 ne total output pins is a b) greater than ncessor use bit arco b) 4 or 8 Period CPU has?	<ul> <li>c) 3</li> <li>rchitecture of the micro</li> <li>c) Data transfer</li> <li>unt of RAM accessed a</li> <li>c) Hertz</li> <li>umber of pins on the m</li> <li>c) System Bus</li> <li> bit.</li> <li>c) 3</li> <li>lways to the t</li> <li>c) less than</li> <li>chitecture.</li> <li>c) 32 or 64</li> </ul>	<ul> <li>d) 2</li> <li>oprocessor?</li> <li>d) Operations at the time?</li> <li>d) Data bus icroprocessor?</li> <li>d) Word Size</li> <li>d) 2</li> <li>otal input pins.</li> <li>d) not equal</li> <li>d) 64 or 128</li> </ul>
38 39 40 41 42 43 44	<ul> <li>a) 5</li> <li>Which of the followin</li> <li>a) 1 / O pins</li> <li>Which of the followin</li> <li>a) Clock speed</li> <li>Which of the followin</li> <li>a) Hertz</li> <li>The first commercial</li> <li>a) 8</li> <li>In Microprocessor, th</li> <li>a) equal</li> <li>The present micropro</li> <li>a) 8 or 16</li> <li>How many types of R</li> <li>a) 4</li> </ul>	b) 4 ng in turn determines a b) Control flow ng determines the amore b) Word size ng accessed the total me b) Clock speed microprocessor is a b) 16 ne total output pins is a b) greater than necessor use bit are b) 4 or 8 Register the CPU has?	<ul> <li>c) 3</li> <li>rchitecture of the micro</li> <li>c) Data transfer</li> <li>unt of RAM accessed a</li> <li>c) Hertz</li> <li>umber of pins on the m</li> <li>c) System Bus</li> <li>bit.</li> <li>c) 3</li> <li>lways to the t</li> <li>c) less than</li> <li>chitecture.</li> <li>c) 32 or 64</li> </ul>	<ul> <li>d) 2</li> <li>oprocessor?</li> <li>d) Operations at the time?</li> <li>d) Data bus</li> <li>icroprocessor?</li> <li>d) Word Size</li> <li>d) 2</li> <li>otal input pins.</li> <li>d) not equal</li> <li>d) 64 or 128</li> <li>d) 16</li> </ul>
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38 39 40 41 42 43 44 45	<ul> <li>a) 5</li> <li>Which of the followin</li> <li>a) I / O pins</li> <li>Which of the followin</li> <li>a) Clock speed</li> <li>Which of the followin</li> <li>a) Hertz</li> <li>The first commercial</li> <li>a) 8</li> <li>In Microprocessor, th</li> <li>a) equal</li> <li>The present micropro</li> <li>a) 8 or 16</li> <li>How many types of F</li> <li>a) 4</li> <li>Expansion of MDR is</li> <li>a) Maga Data Bagista</li> </ul>	b) 4 ng in turn determines a b) Control flow ng determines the amo b) Word size ng accessed the total m b) Clock speed microprocessor is a b) 16 total output pins is a b) greater than cessor use bit arc b) 4 or 8 Register the CPU has? b) 2 s	<ul> <li>c) 3</li> <li>rchitecture of the micro</li> <li>c) Data transfer</li> <li>unt of RAM accessed a</li> <li>c) Hertz</li> <li>umber of pins on the m</li> <li>c) System Bus</li> <li>bit.</li> <li>c) 3</li> <li>lways to the t</li> <li>c) less than</li> <li>chitecture.</li> <li>c) 32 or 64</li> <li>c) 8</li> <li>b) Micro Data Bagist</li> </ul>	<ul> <li>d) 2</li> <li>oprocessor?</li> <li>d) Operations at the time?</li> <li>d) Data bus icroprocessor?</li> <li>d) Word Size</li> <li>d) 2</li> <li>otal input pins.</li> <li>d) not equal</li> <li>d) 64 or 128</li> <li>d) 16</li> </ul>
38 39 40 41 42 43 44 45	<ul> <li>a) 5</li> <li>Which of the followin</li> <li>a) I / O pins</li> <li>Which of the followin</li> <li>a) Clock speed</li> <li>Which of the followin</li> <li>a) Clock speed</li> <li>Which of the followin</li> <li>a) Hertz</li> <li>The first commercial</li> <li>a) 8</li> <li>In Microprocessor, th</li> <li>a) equal</li> <li>The present micropro</li> <li>a) 8 or 16</li> <li>How many types of R</li> <li>a) 4</li> <li>Expansion of MDR is</li> <li>a) Mega Data Register</li> </ul>	b) 4 ng in turn determines a b) Control flow ng determines the amor b) Word size ng accessed the total nu b) Clock speed microprocessor is a b) 16 te total output pins is a b) greater than cessor use bit arc b) 4 or 8 Register the CPU has? b) 2 s cr	<ul> <li>c) 3</li> <li>rchitecture of the micra</li> <li>c) Data transfer</li> <li>unt of RAM accessed a</li> <li>c) Hertz</li> <li>umber of pins on the m</li> <li>c) System Bus</li> <li>bit.</li> <li>c) 3</li> <li>lways to the t</li> <li>c) less than</li> <li>chitecture.</li> <li>c) 32 or 64</li> <li>c) 8</li> <li>b) Micro Data Register</li> </ul>	<ul> <li>d) 2</li> <li>oprocessor?</li> <li>d) Operations at the time?</li> <li>d) Data bus incroprocessor?</li> <li>d) Word Size</li> <li>d) 2</li> <li>otal input pins.</li> <li>d) not equal</li> <li>d) 64 or 128</li> <li>d) 16</li> </ul>
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		www.Padasalai.Net	www.Trb]	11 <sup>th</sup> Computer Science
	50	Which has controls read or write operations	)	
	50.	a) System Bus b) Data Bus	a) Control Bus	d) Address Bus
	51	The read operation transfer data from moment	c) Control Dus	d) Address Bus
	51.	a) MAD	a) BC	d) Instruction sat
	52	Which operation transform data from the ME	C) FC	d) Instruction set
	52.	a) Read b) Conv	a) Move	d) Write
	53	In 8 bit processor, its MDP and the word in	the memory have	u) white
	55.	a) 16 b) 8	a) 256	01t.
	51	How many types of Microprocessor are ther	$c_{j} 230$	u) 04
	54.	a) 2 b) $A$	c	d) 8
	55	How many classification of Microprocessor	or there based on the	Data Width?
	55.	a) 4 b) 8	c) 16	d) 64
	56	Which of the following microprocessor is no	the classification has	ed on data size?
	50.	a) 8 b) 16	c) 32	d) 128
	57	How many types of Microprocessor are ther	e based on Instruction	set?
	57.	a) 8 b) 16		d) 2
	58	Expansion of RISC is	0) 4	u) 2
	50.	a) Reduced Information Set Computers	h) Reduced Instructi	ion Set Computers
		c) Reading Information Set Computers	d) Reader Inclusion S	vstem Computers
	59	Expansion of CISC is	u) Redder merusion s	ystem computers
	57.	a) Communication information Set Compute	ers	
		b) Complex Information Set Computers		
		c) Classified Instruction Set Computers		
		d) Complex Instruction Set Computers		
	60	Which of the following is not an example of	<sup>2</sup> RISC processor?	
	00.	a) Intel P6 b) Pentium IV	c) Pentium II	d) AMD K6
	61.	Which of the following is not an example of	CISC processor?	
	575	a) Intel P6 b) Pentium IV	c) Pentium H	d) AMD K6
$\rangle$	62.	Expansion of DVD is		
	/	a) Digital Versatile Disc	b) Digital Video Disp	lav OL VUU
		c) Digital Versatile Digital	d) Digital Versatile D	isplay
	63.	The color of double-layered DVD is .		1 2
		a) Silver b) Bronze	c) Blue	d) Gold
	64.	The color of Single-layered DVD is	•	
		a) Silver b) Bronze	c) Blue	d) Gold
	65.	Expansion of HDMI is		
		a) Higher Display Multimedia Information		
		b) High Definition Memory Information		
		c) High Definition Multimedia Interface		
		d) High Definition Media Interface		
	66.	Expansion of USB is		
		a) Uniform Source Bus	b) Universal Source E	Bus
		c) Universal System Bus	d) Universal Serial E	Bus
	67.	Which of the following transfer data up to 5	Gigabyte / second?	
		a) USB 1.0 b) USB 2.0	c) USB 3.0	d) USB 1.2
	68.	Which of the following is the today &x0027	's basic component of	electronics?
		a) IC's b) Transistor	c) Silicon	d) Vacuum Tube
	69.	Which of the following is the behind a comp	outer?	
		a) IC's <b>b) Microprocessor</b>	c) CPU	d) Memory Unit
	70.	A CD or CD-ROM is made from thic	kness.	
		a) 10mm b) 15mm	c) 1.4mm	d) 1.2mm
	71.	How the CD data is represented?	\ <b>T</b> 1	
		a) Pits b) Tracks	c) Lands	d) Rings
	12	UVU can hold the data more than time	es of CD	

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c) Four

d) Three

b) Six

a) Five

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73. USB Port consumes power	DC.	
a) 3V b) 2V	c) 5V	d) More than 5v
74. The capacity of Blue ray disc is m	nore than five times of	
a) CD <b>b) DVD</b>	c) Flash Drive	d) HDD
75. Which of the following is an impo	ortance consideration while ca	ategorizing microprocessors?
a) Register b) Pins	c) Instruction Set	d) Program Counter
76. How many control line is enough	to have read or write operation	on?
a) Only One b) Only Tw	c) Only Four	d) More than One
77. Which of the following company	manufacturing especially mot	ther board and processor?
a) IBM <b>b) Intel</b>	c) Motorola	d) Samsung
78. The color of double-layered DVD	) is	
a) Silver b) Bronze	c) Blue	d) Gold
79. Which is a state non volatile stora	ge medium?	
a) Blu-Ray b) Flash m	emory c) Cache memory	d) DVD
80. Which memory offers a fast read	and write access time?	
a) Flash b) Cache	c) Hard disk	d) Main
81. In which memory contents can be	erased using UV rays?	
a) PROM b) EEPROM	M c) ROM	d) EPROM
82. Which of the following is to write	e HD videos?	
a) Blu-Ray b) DVD	` c) CD	d) SVCD
83. A CD or CD-ROM is made from	thickness.	
a) 10mm b) 15mm	c) 1.4mm	d) 1.2mm

#### **Answer the following:**

What are the parameters which influence the characteristics of microprocessor? A microprocessor's performance depends on the following characteristics:

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

#### 2. What is an instruction?

A command which is given to a computer to perform an operation on data is called an instruction.

#### 3. What is a 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.

#### 4. What is HDMI?

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

#### 5. Which source is used to erase the content of a EPROM?

Ultra-violet-rays is used erase the content of a EPROM.

#### 6. Differentiate Computer Organization from Computer Architecture.

Computer architecture deals with the engineering considerations involved in designing a computer. Computer Organization deals with hardware components that are transparent to the programmer.

# 7. Classify the microprocessor based on the size of the data.

Microprocessors can process instructions. The microprocessor can be classified as follows based on the size of the data.

- i. 8-bit microprocessor.
- ii. 16-bit microprocessor.
- iii. 32-bit microprocessor.
- iv. 64-bit microprocessor.

# 8. Write down the classifications of microprocessors based on the instruction set.

The two types of microprocessors which are based on their instruction sets.

- i. Reduced Instruction Set Computers (RISC)
- ii. Complex Instruction Set Computers (CISC)

# 9. Differentiate PROM and EPROM.

PROM can be written only and 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.

# 10. Write down the interface and ports available in a computer.

The various types of ports are given below:

- **Serial Port:** To connect the external devices, found in old computer.
- **Farallel Port:** To connect the printers found in old computer.
- **USB Port:** To connect external devices like camera, scanners, mobile phones external hard disks and printers to the computer.

# 11. Differentiate CD and DVD.

	$\mathbf{CD}$	DVD
	Expansion is Compact-Disc.	Expansion is Digital Versatile
$\vee$ $\vee$	• A standard CD can store about 700 MB	D'ODisc. CULOL V C
	of Data.	<ul> <li>A standard DVD can hold 4.7 GB</li> </ul>
	<ul> <li>CD players cannot play DVDs.</li> </ul>	of Data.
	<ul> <li>It stores up to 80 min of audio.</li> </ul>	<ul> <li>DVD players can play CDs.</li> </ul>
		<ul> <li>It can range from 4.7 GB to 17.08</li> </ul>
		GB.

# 12. How will you differentiate a flash memory and an EEPROM?

Flash Memory	EEPROM
<ul> <li>Faster in performance.</li> </ul>	<ul> <li>Slower in performance.</li> </ul>
<ul> <li>Flash uses the slower NAND gate.</li> </ul>	<ul> <li>EEPROM uses the faster NOR</li> </ul>
<ul> <li>Using flash, access and erase data in</li> </ul>	gate.
block-wise.	<ul> <li>Using EEPROM, access and</li> </ul>
<ul> <li>Storage capacity can range from a GB</li> </ul>	erase data only byte-wise or byte
to hundred of GB.	at a time.
	<ul> <li>Storage capacity can range from a</li> </ul>
	kilobytes to couple of megabytes.

# Answer the Details Question:

# 1. Explain the characteristics of a microprocessor.

A Microprocessor's performance depends on the following characteristics:

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

#### a) 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).

#### **b)** 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. This instruction set carries out the following types of operations:

- Data transfer
- Arithmetic operations
- Logical operations
- Control flow
- Input/output

#### c) Word Size

iA \

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 and the total number of pins on the microprocessor.

Total number of input and output pins in turn determines the architecture of the microprocessor.

2. How the read and write operations are performed by a processor? Explain.

- The Central Processing Unit (CPU) has a Memory Data Register (MDR) and a Memory Address Register (MAR).
- ii. The Memory Data Register (MDR) keeps the data which is transferred between the Memory and the CPU. The Program Counter (PC) is a special register in the CPU which always keeps the address of the next instruction to be executed.
- The Arithmetic and Logic unit of CPU places the address of the memory to be iii. fetched.

into the Memory Address Register.

- A bus is a collection of wires used for communication between the internal iv. components of a computer.
- The address bus is used to point a memory location. A decoder, a digital circuit is V. used to point to the specific memory location where the word can be located.
- vi. The address register is connected with the address bus, which provides the address of the instruction. A data bus is used to transfer data between the memory and the CPU.
- The data bus is bidirectional and the address bus is unidirectional. The control bus vii. controls both read and write operations.
- The read operation fetches data from memory and transfers to MDR. A single viii. control line performs two operations like Read/Write using 1 or 0.
- Also, the write operation transfers data from the MDR to memory. ix. This organization is shown in Figure



Bus connectivity between CPU and Memory

- i. The word in the RAM has the same size (no. of bits) as the Memory Data Register (MDR). If the processor is an 8-bit processor like Intel 8085, its MDR and the word in the RAM both have 8 bits.
- ii. If the size of the MDR is eight bits, which can be connected with a word in the memory which is also eight bits size. The data bus has eight parallel wires to transfer data either from MDR to word or word to MDR based on the control(Read or write).



- iii. This control line is labeled as R/W, which becomes 1 means READ operation and 0 means WRITE operation. Figure shows the content of MDR and the word before the READ operation. Also, Figure shows the content of MDR and the word after the READ operation.
- iv. The read operation transfers the data (bits) from word to Memory Data Register. The write operation transfers the data (bits) from Memory Data Register to word.
- 3. Arrange the memory devices in ascending order based on the access time. Explain (or) Explain the types of Secondary Storage devices.
  - a) CD / DVD Blu-Ray
  - b) Hard disk (Main memory)
  - c) Flash Drives
  - d) Cache Memory

#### Compact Disc (CD)

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", encoded in a spiral track molded into the top of the polycarbonate layer. 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.

#### DVD (Digital Versatile Disc or Digital Video Disc)

A DVD is an optical disc capable of storing up to 4.7 GB of data, more than six times what a CD can hold. DVDs are often used to store movies at a better quality. Like CDs, 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, whereas the single sided, double layer has 8.5 GB capacity. The 8 cm DVD has 1.5 GB capacity. The capacity of a DVD-ROM can be visually determined by noting the number of data sides of the disc. Double-layered sides are usually gold-colored, while single-layered sides are usually silver-colored, like a CD.

#### **Blu-Ray Disc**

Blu-Ray Disc is a high-density optical disc similar to DVD. Blu-ray is the type of disc 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. This is more than 5 times the capacity of a DVD, and above 70 times of a CD. 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. But, Blu-ray uses a blue-violet laser to write. Hence, it is called as Blu-Ray.

#### 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.

#### **Flash Memory**

Flash memory is an electronic (solid-state) non-volatile computer storage medium that can be electrically erased and reprogrammed. They are either EEPROM or EPROM. Examples for Flash memories are pen-drives, 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).

#### **Cache Memory**

The cache memory is a very high speed and expensive memory, which is used to speed up the memory retrieval process. Due to its higher cost, the CPU comes with a smaller size of cache memory compared with the size of the main 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. The idea of introducing a cache is that, this extremely fast memory would store data that is frequently accessed and if possible, the data that is closer to it. This helps to achieve the fast response time. Where response Time, (Access Time) refers to how quickly the memory can respond to a read / write request.

#### 4. Explain the Types ROMs.

- Read-only Memory (ROM)
- Programmable Read-only Memory (PROM)
- Erasable Programmable Read-only Memory (EPROM)
- Electrically Erasable Read-only Memory (EEPROM)

#### **Read-only Memory (ROM)**

- ✓ Read Only Memory refers to special memory in a computer with pre-recorded 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. So, ROM is called as a non-volatile memory.

#### Programmable Read-only Memory (PROM)

- ✓ Programmable read only memory is also a non-volatile memory on which data can be written only once. Once a program has been written onto a PROM, it remains there forever.
- ✓ Unlike the main memory, PROMs retain their contents even when the computer is turned off.
- ✓ The PROM differs from ROM. PROM is manufactured as a blank memory, whereas a ROM is programmed 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.

#### Erasable Programmable Read Only Memory (EPROM)

- ✓ Erasable Programmable Read Only Memory is a special type of memory which serves as a PROM, but the content can be erased using ultraviolet rays. EPROM retains its contents until it is exposed to ultraviolet light. The ultraviolet light clears its contents, making it possible to reprogram the memory.
- ✓ An EPROM differs from a PROM, PROM can be written only once and 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.

#### **Electrically Erasable Programmable Read Only Memory (EEPROM)**

Electrically Erasable Programmable Read Only Memory is a special type of PROM that can be erased by exposing it to an electrical charge.

Like other types of PROM, EEPROM retains its contents even when the power is turned off. Comparing with all other types of ROM, EEPROM is slower in performance.

# **Extra Question and Answer:**

1. Name the communication channels between the microprocessor and other devices in the computer. (OR) What are the collections of System Bus?

Address Bus Control Bus Data Bus

2. Name the measurement of clock speed of the computer. MHz (Mega Hertz)

GHz (Giga Hertz)

3. Draw the block diagram of a microprocessor based system.



A Microprocessor - Based System

#### 4. What is instruction set?

Basic set of machine level instructions that a microprocessor is designed to execute is called as an instruction set.

# 5. What is word size?

The number of bits that can be processed by a processor in a single instruction is called its word size.

#### 6. Name the different types of CPU Register.

- MAR (Memory Address Register)
- MDR (Memory Data Register)

#### 7. What is Bus?

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

#### 8. Define - Data bus

- Data bus is collection of wires to carry data in bits.
- A data bus is used to transfer data between the memory and the CPU.
- The data bus is bidirectional.

#### 9. Define – Address bus.

- Address bus is collection of wires to carry data bits.
- The address bus is used to point a memory location.
- The address bus is unidirectional.

#### **10. Define – Control bus.**

- Control bus is a control line / collection of wires to control the operation / functions.
- The control bus controls both read and write operations.

#### 11. What is the use of MDR?

MDR keeps the data which is transfered between the memory and the CPU.

#### **12. Define Decoder.**

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

#### 13. What is the use of Address Bus and Data Bus?

Address Bus is used to point the memory location. Data Bus is used to transfer data between the memory and the CPU.

#### 1. Explain the Classification of Microprocessors based on Instruction Set.

- The size of the instruction set is another important consideration while categorizing microprocessors. Initially, microprocessors had very small instruction sets because complex hardware was expensive as well as difficult to build.
- As technology had developed to overcome these issues, more and more complex instructions were added to increase the functionality of microprocessors.
- Let us learn more about the two types of microprocessors based on their instruction sets.
- 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.
- CISC stands for Complex Instruction Set Computers. They support hundreds of instructions. Computers supporting CISC can 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. Explain about Random-Access Memory (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 in current use are kept temporarily so that they can be accessed by the computer's processor.
- The smallest unit of information that can be stored in the memory is called as a bit. The memory can be accessed by a collection of 8 bits which is called as a byte.
- The bytes are referred by 'B'. If a computer has 1 megabyte of memory, then it can store 10,48,576 bytes (or characters) of information. [Hence 1MB is 1024KB and 1 KB is 1024 Bytes, So 1024X1024 =10,48,576 Bytes]
- RAM is a volatile memory, which means that the information stored in it is not permanent. As soon as the power is turned off, whatever data that resides in RAM is lost. It allows both read and write operations.
- There are two basic types of RAM
  - Dynamic RAM (DRAM)
  - Static RAM (SRAM)
- These two types differ in the technology they use to hold data. Dynamic RAM being a common type needs to be refreshed frequently. Static RAM needs to be refreshed less often, which makes it faster.
  - Hence, Static RAM is more expensive than Dynamic RAM.

# 3. Explain the ports and Interface.

The Motherboard of a computer has many I/O sockets that are connected to the ports and interfaces found on the rear side of a computer (Figure 3.13). The external devices can be connected to the ports and interfaces. The various types of ports are given below:

Serial Port: To connect the external devices, found in old computers.

Parallel Port: To connect the printers, found in old computers.

**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. USB3.1 and USB 3.2 are also released.

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.

Computer hardware	The physical parts or components of a computer, such as the CPU, mother board, monitor, keyboard, etc.	
Intel	Intel Corporation is an American multinational corporation and technology company involving in hardware manufacturing, especially mother board and processors	
Silicon chip	Silicon chip is an integrated , set of electronic circuits on one small flat piece of semiconductor material, silicon.	
Multipurpose	Multipurposeis several purpose	
Address bus	Address bus is a collection of wires that carry the address as bits	
Data bus	Data bus is a collection of wires to carry data in bits	
Control bus	Control bus is a control line/collection of wires to control the operations/functions	
Arithmetic operations	Arithmetic operations are the mathematical operations on data like add, subtract etc	
Data Transfer	Data Transfer means moving data from one component to another	
Logical operations	Logical operations are the operations on binary/Boolean data like AND, OR , NOT	
Bidirectional	Bidirectional means both the directions/ways         Unidirectional means only one direction         Access time is the time delay or latency between a request to an electronic system, and the access being completed or the requested data returned	
Unidirectional		
Access time		

