

Chapter 1 - Hardware Concepts

Type A: Very Short Answer Questions

1.	What is computer?
Ans:	A computer is an electronic device that can perform a variety of tasks according to the given instructions.
2	What are the functional components of a digital computer?
Ans:	1. Input unit 2. Output unit 3. Central Processing Unit 4. Memory
3	What are the components of CPU? What is the function of control unit of CPU?
Ans:	The CPU has two components: 1. Arithmetic Logic Unit (ALU) 2. Control Unit (CU) The function of control unit of CPU is the program execution i.e., carrying out all the instructions stored in the program.
4	What role does the input unit play in a computer? What role does the output unit play in a computer?
Ans:	The input unit takes the input and converts it into binary form so that it can be understood by the computer. The output coming from the CPU is in the form of electronic binary signals which needs conversation in some form which can be easily understood by human beings i.e., characters, graphical or audio visual.
5	What is the function of ALU?
Ans:	The ALU performs all the four arithmetical (+, -, *, /) and some logical (<, >, =, <=, >=, <>) operations.
6	What is the function of main memory? What are the measuring units of memory?
Ans:	The memory temporarily holds the data and information during processing. The smallest unit of memory is a byte (8 bits). A byte can store one character in binary form. Other measuring units are 1 kilobyte (KB) equal to 1024 (2^{10}) bytes, 1 Megabyte (MB) equal to 1024 KB, 1 Gigabyte (GB) equal to 1024 MB and 1 Terabyte (TB) equal to 1024 GB.
7	Which of the following is not hardware: (a) Hard disk (b) Printer (c) Keyboard (d) CPU (e) Assembler (f) Program to print table of 13?
Ans:	(f) Program to print table of 13.
8	What do you mean by the terms 'Hardware', Software, Firmware?
Ans:	Hardware: These are the physical or tangible components of a computer. Software: It is a set of programs required to run the hardware and govern the system operations. Firmware: Firmware is the prewritten programs permanently stored in read-only memory.
9	What are the main types of software?
Ans:	Following are the main type of software: 1. Operating System 2. Language Processors 3. Application Software
10	What are the functions of operating system and language processor? Give examples.
Ans:	Operating System: Loads necessary programs (into the computer memory) which are required for proper computer functioning. Example of operating system are –Single user, multiuser, batch processing, multiprocessing etc. Language processor: Process an HLL (High Level Language) program so as to make it understandable to the computer. Examples of language processor are –Interpreter, compiler, Assembler.
11	What is the function of assembler, compiler and interpreter?
Ans:	Assembler: Converts the program written in assembly language into machine language. Compiler: Converts the HLL program into machine language but the conversion manner is different. Interpreter: Converts an HLL program into machine language by converting and executing it line by line.
12	What do you understand by application software?
Ans:	Application software is the set of programs necessary to carry out operations for a specified application.
13	What are the main limitations of computers?

Ans:	Following are the main limitation of computer: 1. Lack of Decision Making Power. 2. IQ Zero
14	What are different categories of a computer?
Ans:	Following are the different categories of a computer: 1. Digital Computers 2. Analog Computers 3. Hybrid Computers
15	Which type of computer contains several processors running together? Give an example of such type of computer.
Ans:	Super computer contains several processors running together. Examples are CRAY X-MP-14, CDC-205, ETA GF-10.
16	write the full forms of the following terms: VDU, MICR, OMR, LCD, OCR, DMP, CRT, CD-ROM, CD-R, DVD, DVD-R
Ans:	VDU: Visual Display Unit MICR: Magnetic Ink Character Reader OMR: Optical Mark reader LCD: Liquid crystal display OCR: Optical Character reader DMP: Dot Matrix Printer CRT: Cathode Ray Tube CD-ROM: Compact Disk-Read Only Memory CD-R: Compact Disk Recordable DVD: Digital Video Disk DVD-R: Digital Video Disk-Recordable
17	Name some pointing devices.
Ans:	1. The Mouse 2. The Light Pen 3. Touch Screens 4. Joystick
18	What are two categories of impact printers? What is the advantage of non-impact printers over impact printers?
Ans:	Following are two categories of impact printers: 1. Line printers 2. Dot Matrix Printer Non-impact printers are fast compared to an impact printer.
19	Out of the following devices, write whether they are input devices, output devices or storage devices. Also write their function. (i) Light pen (ii) Flatbed plotter (iii) Drum printer (iv) Joystick (v) OMR (vi) Web camera (vii) Optical disk (viii) Magnetic disk (ix) MICR (x) DVD
Ans:	Input Devices 1. Light pen: Light pen is used to draw images on the screen. With the movement of the light pen over the screen, the lines are drawn. 2. Joystick: Joystick is used to play games as it controls the movement of objects quickly and accurately. In some cases joystick are used to control the velocity of the screen cursors movement rather than its absolute position. 3. Web camera: It is used to generate images that can be accessed by and displayed on web browsers through a server. 4. MICR: It reads character by magnetizing the ink and by examining the shape of the character. MICRs are mainly used by banks. 5. OMR: Optical Mark Reader (OMR) uses infra-red light to scan marks on prepared forms such as multiple-choice examination answer sheets or lottery tickets. Output Devices 1. Drum printer: An old line printer technology that used formed character images around a cylindrical drum as its printing mechanism.

	2. Flatbed plotter: A flatbed plotter is a device that uses pens to draw graphics and pictures, instead of printing heads, nozzles, and ink cartridges used in typical printers. Storage Devices 1. DVD: It is used for storing information in digital form. 2. Optical disk: It Stores data optically & used laser to read/write. 3. Magnetic disk: It Stores data in magnetic form.								
20	Briefly discuss the printing mechanism of (i) laser printer (ii) inkjet printer.								
Ans:	(i) Laser printer –Laser printers are non-impact printers which can print text and images in high speed and high quality resolution, ranging from 600 to 1200 dpi. (ii) Inkjet printer –An inkjet printer is any printer that fires extremely small droplets of ink onto paper to create impression of text or images. The inkjet printers direct a high-velocity stream of ink toward the paper.								
21	Compare the drum plotter and flat bed plotter.								
Ans:	The drum plotters are generally smaller than flatbed plotters. The drum plotters have lower resolutions than flatbed.								
22	Briefly explain (i) VDU (ii) LCD.								
Ans:	(i) VDU –Stands for "Visual Display Unit." A VDU displays images generated by a computer or other electronic device. (ii) LCD –Stands for "Liquid Crystal Display." LCDs are super-thin displays that are used in laptop computer screens and flat panel monitors.								
23	What are the two types of RAM? Name various types of ROMs. Write their names in full form.								
Ans:	Types of RAM 1. SRAM –Static Random Access Memory 2. DRAM –Dynamic Random Access Memory Types of ROM 1. PROM –Programmable Read-Only Memory 2. EPROM –Erasable Programmable Read-Only Memory 3. EEPROM –Electrically Erasable Programmable Read-Only Memory								
24	How are magnetic disks different from optical disks?								
Ans:	<table border="1"> <thead> <tr> <th>Magnetic disk</th><th>Optical disk</th></tr> </thead> <tbody> <tr> <td>Stores data in magnetic form</td><td>Stores data optically & used laser to read/write</td></tr> <tr> <td>It is affected by magnetic field.</td><td>It is not affected by magnetic field.</td></tr> <tr> <td>It has high storage capacity.</td><td>It has less storage than hard disk.</td></tr> </tbody> </table>	Magnetic disk	Optical disk	Stores data in magnetic form	Stores data optically & used laser to read/write	It is affected by magnetic field.	It is not affected by magnetic field.	It has high storage capacity.	It has less storage than hard disk.
Magnetic disk	Optical disk								
Stores data in magnetic form	Stores data optically & used laser to read/write								
It is affected by magnetic field.	It is not affected by magnetic field.								
It has high storage capacity.	It has less storage than hard disk.								
25	Define the following terms: (i) cylinder (ii) tracks (iii) sectors.								
Ans:	(i) Cylinder –A cylinder is a location made up of the same track on all the platters. (ii) Tracks –Concentric circles on the magnetized surface of the magnetic disks are known as Tracks. (iii) Sectors –The tracks on the disk surface are divided into invisible segments known as Sectors.								
26	What are optical disks?								
Ans:	Optical disk is any storage media that holds content in digital format and is read using a laser assembly is considered optical media. The types of optical disks are CDs, and DVDs.								
27	What is communication bus? What are its types?								
Ans:	Communication bus is a collection of wires that transmit binary numbers, one bit per wire. Microprocessor communicates with memory and other devices (input and output) using three buses: - Address Bus - Data Bus - Control Bus								
28	What is port? Name some port types briefly.								
Ans:	Ports are used to connect external devices to the computer. Several types of ports are there, example of some 1. Network Ports – It is an address (16-bit address) within a computer, usually associated with a particular application protocol.								

	2. Serial Ports –They transfer data serially a bit at a time Needs only wire to transmit 8 bits, it is also known as COM port. 3. Parallel Ports – A byte (8-bit) is transferred at a time in parallel port, 8-bits are transmitted parallel to each other. Parallel ports are very commonly used for printer, scanner, CD writer and many other external devices.
29	Name two ports that allow wireless connection of devices.
Ans:	1. InfraRed Port (IR port) 2. Bluetooth
30	What do you understand by IPO cycle?
Ans:	IOP –Input Output Process. Every task follows this Input-Process-Output (IOP cycle). A computer also follows the I-O-P cycle i.e., it needs certain input, carries out a process and produces the output.

Type B: Short Answer Questions

1	What is computer? What are its characteristics?
Ans:	A computer is an electronic device that can perform a variety of tasks according to the given instructions. Characteristics of computer: 1. Speed 2. Accuracy 3. Versatility 4. Reliability 5. Power of Remembering 6. No I.Q 7. Common Data Used 8. Diligence 9. Storage
2	Briefly explain the significance of Input-Process-Output Cycle.
Ans:	Example : Input –Your desire to make a phone call at number 7455165 Process –Dialing up the number. Output –Chat with your friend. In above example undergo these three stages. The first stage is called input stage. The second stage is called process stage and the third stage is called output stage. Certain input is needed to accomplish a task; a process is carried out on the input to obtain the output. Every task follows this Input-Process-Output (IOP cycle). A computer also follows the I-O-P cycle i.e., it needs certain input, carries out a process and produces the output.
3	Briefly explain the basic architecture of a computer.
Ans:	Computer follows input-process-output cycle, the first stage is performed in computer by input unit, second stage is performed by its central processing unit and the third stage is performed by output unit. Thus the basic structure of computer is as shown below. 1. Input Unit The input unit is formed by the input devices attached to the computer. Example of input devices and media are: keyboard, mouse, joystick etc. 2. Central Processing Unit (CPU) The CPU is the control center for a computer. It guides, directs and governs its performance. It is the brain of the computer. The CPU has two components which are responsible for different functions. These two components are its Control Unit (CU) and Arithmetic Logic Unit (ALU). 3. Output Unit The output unit is formed by the output devices attached to the computer. Some popular output devices are VDU (Visual Display Unit), printer, plotter, speech synthesizer and coder etc. 4. The Memory The memory of computer is often called main memory or primary memory. It is generally the third component of CPU. The memory of computer is more like a predefined working place, where it temporarily

	keeps information and data to facilitate its performance.																		
4	What do you understand by input unit? What is its significance?																		
Ans:	The input unit is formed by the input devices attached to the computer. An input unit takes the input and converts it into binary form so that it can be understood by the computer. Example of input devices and media are: keyboard, mouse, magnetic ink character reader (MICR), optical mark reader (OMR), optical character reader (OCR), joystick etc.																		
5	What is the function of CPU in a computer system? What are its subunits?																		
Ans:	CPU guides, directs and governs its performance. It is the brain of the computer. Following are the subunits of CPU: 1. Control Unit (CU) 2. Arithmetic Logic Unit (ALU).																		
6	What functions are performed by the control unit? Can we call it the control centre of computer system? Why?																		
Ans:	The function of control unit of CPU is the program execution i.e., carrying out all the instructions stored in the program. Yes we can call it the control centre of computer system because it guides, directs and governs its performance. It is the brain of the computer.																		
7	What functions are performed by the ALU? Is it an independent unit? If not, which unit does ALU work in coordination with?																		
Ans:	The ALU performs all the four arithmetical (+, -, *, /) and some logical (<, >, =, <=, >=, <>) operations. No, it is not an independent unit. ALU works in coordinate with CU.																		
8	Distinguish between (i) Input unit and Output unit (ii) CPU and ALU (iii) Data and Information.																		
Ans:	(i) Input unit and Output unit <table border="1"> <thead> <tr> <th>Input</th><th>Output</th></tr> </thead> <tbody> <tr> <td>↪ An input device is a component used to feed information to a computer.</td><td>↪ An output device gives processed information back to the user.</td></tr> <tr> <td>↪ Example: keyboard, mouse, magnetic ink character reader (MICR), optical mark reader (OMR), optical character reader (OCR), joystick etc.</td><td>↪ Example: VDU (Visual Display Unit), printer, plotter, speech synthesizer and coder etc.</td></tr> </tbody> </table> (ii) CPU and ALU <table border="1"> <thead> <tr> <th>CPU</th><th>ALU</th></tr> </thead> <tbody> <tr> <td>↪ The CPU is the master driver of a computer.</td><td>↪ The ALU (Arithmetic-Logic Unit) is generally a subsection of the CPU (Central Processing Unit).</td></tr> <tr> <td>↪ The CPU guides, directs and governs its performance.</td><td>↪ The ALU performs arithmetical and logical operations.</td></tr> </tbody> </table> (iii) Data and Information <table border="1"> <thead> <tr> <th>Data</th><th>Information</th></tr> </thead> <tbody> <tr> <td>↪ Data is raw, unorganized facts that need to be processed. Data can be something simple and seemingly random and useless until it is organized.</td><td>↪ When data is processed, organized, structured or presented in a given context so as to make it useful, it is called Information.</td></tr> <tr> <td>↪ Each student's test score is one piece of data.</td><td>↪ The class' average score or the school's average score is the information that can be concluded from the given data.</td></tr> </tbody> </table>	Input	Output	↪ An input device is a component used to feed information to a computer.	↪ An output device gives processed information back to the user.	↪ Example: keyboard, mouse, magnetic ink character reader (MICR), optical mark reader (OMR), optical character reader (OCR), joystick etc.	↪ Example: VDU (Visual Display Unit), printer, plotter, speech synthesizer and coder etc.	CPU	ALU	↪ The CPU is the master driver of a computer.	↪ The ALU (Arithmetic-Logic Unit) is generally a subsection of the CPU (Central Processing Unit).	↪ The CPU guides, directs and governs its performance.	↪ The ALU performs arithmetical and logical operations.	Data	Information	↪ Data is raw, unorganized facts that need to be processed. Data can be something simple and seemingly random and useless until it is organized.	↪ When data is processed, organized, structured or presented in a given context so as to make it useful, it is called Information.	↪ Each student's test score is one piece of data.	↪ The class' average score or the school's average score is the information that can be concluded from the given data.
Input	Output																		
↪ An input device is a component used to feed information to a computer.	↪ An output device gives processed information back to the user.																		
↪ Example: keyboard, mouse, magnetic ink character reader (MICR), optical mark reader (OMR), optical character reader (OCR), joystick etc.	↪ Example: VDU (Visual Display Unit), printer, plotter, speech synthesizer and coder etc.																		
CPU	ALU																		
↪ The CPU is the master driver of a computer.	↪ The ALU (Arithmetic-Logic Unit) is generally a subsection of the CPU (Central Processing Unit).																		
↪ The CPU guides, directs and governs its performance.	↪ The ALU performs arithmetical and logical operations.																		
Data	Information																		
↪ Data is raw, unorganized facts that need to be processed. Data can be something simple and seemingly random and useless until it is organized.	↪ When data is processed, organized, structured or presented in a given context so as to make it useful, it is called Information.																		
↪ Each student's test score is one piece of data.	↪ The class' average score or the school's average score is the information that can be concluded from the given data.																		
9	What is the function of output unit in a computer system? Give examples of some output devices.																		
Ans:	The output coming from the CPU is in the form of electronic binary signals which needs conversion in some form which can be easily understood by human beings i.e., characters, graphical or audio visual. This function of conversation is performed by output units. Example of output devices are VDU (Visual Display Unit), printer, plotter, speech synthesizer and coder etc.																		
10	What role does memory play in the functioning of computer system?																		
Ans:	The memory of a computer is more like a predefined working place, where it temporarily keeps information and data to facilitate its performance.																		

11	What is a bit? What is binary code?								
Ans:	A bit is an elementary unit of the memory. A Binary code is a way of representing text or computer processor instructions by the use of the binary number system's two-binary digits 0 and 1.								
12	Define each of the following: (a) nibble (b) byte (c) kilobyte (d) megabyte (e) gigabyte (f) terabyte.								
Ans:	(a) nibble –A group of 4 bits is called a nibble. (b) byte –A group of 8 bits is called a byte. (c) kilobyte –A group of 1024 bytes is called a kilobyte. (d) megabyte –A group of 1024 kilobyte is called megabyte. (e) gigabyte –A group of 1024 megabyte is called gigabyte. (f) terabyte –A group of 1024 gigabyte is called terabyte.								
13	What is the meaning of the term volatile primary memory? What can be done to overcome the problems of volatility?								
Ans:	The meaning of the term volatile primary memory is temporarily primary memory. RAM is the volatile primary memory. We can use ROM to overcome the problems of volatility.								
14	Distinguish between internal and external memory.								
Ans:	<table><tr><th>Internal Memory</th><th>External Memory</th></tr><tr><td>Internal memory stores information on your computer.</td><td>External memory stores it on a portable device.</td></tr><tr><td>Example: ROM, RAM.</td><td>Example: Memory stick, MultiMedia card.</td></tr></table>			Internal Memory	External Memory	Internal memory stores information on your computer.	External memory stores it on a portable device.	Example: ROM, RAM.	Example: Memory stick, MultiMedia card.
Internal Memory	External Memory								
Internal memory stores information on your computer.	External memory stores it on a portable device.								
Example: ROM, RAM.	Example: Memory stick, MultiMedia card.								
15	Draw a block diagram of the main units of a computer hardware system.								
Ans:	<pre>graph LR; Input[INPUT UNIT] --> CPU[CENTRAL PROCESSING UNIT (CPU)]; CPU --> Output[OUTPUT UNIT]; CPU <--> Memory[MAIN MEMORY]; CPU <--> Storage[(Storage Devices)];</pre>								
16	What are the differences between hardware, software and firmware?								
Ans:	<table><tr><th>Hardware</th><th>Software</th><th>Firmware</th></tr><tr><td>Hardware are the physical tangible components of a computer system.</td><td>Software are the computer programs that govern the operation of computers.</td><td>Firmware is the prewritten programs permanently stored in read-only memory. These configure the computer and are not easily modifiable by the user.</td></tr></table>			Hardware	Software	Firmware	Hardware are the physical tangible components of a computer system.	Software are the computer programs that govern the operation of computers.	Firmware is the prewritten programs permanently stored in read-only memory. These configure the computer and are not easily modifiable by the user.
Hardware	Software	Firmware							
Hardware are the physical tangible components of a computer system.	Software are the computer programs that govern the operation of computers.	Firmware is the prewritten programs permanently stored in read-only memory. These configure the computer and are not easily modifiable by the user.							
17	What are the software classifications? Discuss their functioning in brief.								
Ans:	Software can be classified into three categories: 1. Operating System –loads necessary programs (into the commuter memory) which are required for proper computer functioning. 2. Language processors –Process an HLL (High Level Language) program so as to make it understandable to the computer. 3. Application software –These are the programs written by the programmers to enable computer to perform a specific task such as inventory control, medical accounting, financial accounting, result preparation, railway reservation, billing etc.								
18	Explain briefly hardware and software.								

Ans:	Hardware –Hardware represents the physical and tangible components of the computer i.e., the components that can be seen and touched. A computer consist of five primary hardware components: 1. Input devices 2. CPU (Central Processing Unit) 3. Storage device 4. Memory 5. Output devices. Software –Software represents the set of programs that govern the operation of a computer system and make the hardware run. Software can be classified into three categories: 1. Operating system 2. Language processor 3. Application software.		
19	What are the advantages and disadvantages of using computers?		
Ans:	Advantages: 1. Speed. 2. High storage capacity. 3. Accuracy. 4. Reliability. 5. Versatility. Disadvantages: 1. Lack of Decision Making Power. 2. IQ Zero.		
20	How are computers classified? How are they different from one another?		
Ans:	The computer have been classified into three categories 1. Digital Computers 2. Analog Computers 3. Hybrid Computers		
	Digital Computer	Analog Computer	Hybrid Computer
	Digital computers deal with discrete quantities.	Analog computers deal with physical quantities. They measure rather than counting as the digital computers do.	Hybrid computers combine the characteristics of analog and digital computers.
21	What do you understand by the term 'Super Computers'? Give the name of a supercomputer installed in India.		
Ans:	A supercomputer is a computer at the frontline of current processing capacity, particularly speed of calculation. Following are the name of a supercomputer installed in India: PARAM, PACE and EKA.		
22	What are RAM and ROM? How are they alike? How are they different?		
Ans	RAM –Random-access Memory. It is also called a read-write memory because you can read the contents of a memory location or write new contents into it. ROM –Read-only memory. This device provides non-volatile storage of programs and data.		
	Compare	Difference	
	Both RAM and ROM are parts of the primary memory. Both Ram and Rom are hardware installed on mother board of computer. Both have memory location from where processor get data for processing	RAM refers to random access memory where both read and write operations can take place. But the RAM is a volatile memory; its contents get lost when power is turned off whereas, ROM refers to read only memory where only read operation can take place. The ROM is a non-volatile memory. Storage capacity of Ram is much more than ROM	

23	What are optical mark readers? How are they used for data input?
Ans:	OMR is a system that gathers information by using a hardware device that detects a reflection or an absence of reflection from a card or piece of paper. It speeds up the process of reading marks on a piece of paper much faster than a human and stores it directly onto a database
24	What does MICR stand for? Who uses MICR? What are advantages and disadvantages of MICR?
Ans:	MICR stands for Magnetic Ink Character Reader. Bank uses MICR. The advantages of MICR are accuracy and its speed. The disadvantage of MICR is that the number of characters that can be recorded with present techniques is very limited. Also, the characters cannot be read repeatedly without losing their magnetism.
25	Give an example of mark-sensing. When is mark-sensing useful, and when it is difficult to use?
Ans:	Bar code Reader It is useful when fast and reliable method of inputting data. Input is limited to a number code.
26	How is optical character recognition (OCR) used for data input? What are the advantages and disadvantages of OCR?
Ans:	It is widely used as a form of data entry from some sort of original paper data source, whether documents, sales receipts, mail, or any number of printed records. The main advantage of an OCR is the accuracy of the documents can be ensured. The disadvantages of an OCR are: (i) limited number of characters offered by it, and (ii) their high cost.
27	How is light pen used? Is it an input or output device?
Ans:	The light pen is used to draw images on the screen. With the movement of the light pen over the screen, the lines are drawn. It is an input device.
28	Name three types of input devices. In each case briefly describe the purpose of the device and how it is operated.
Ans:	Following are the three types of Input devices: 1. The keyboard An important data entry device is the keyboard, which is a typewriter like device. Internally, a keyboard contains a matrix of switches and a keyboard controller. When you press a key, its switch gets pressed and when you release a key, its switch gets released. Through pressing and releasing of switches, keyboard controller generates a scan code using a firmware look up table. This scan code is sent to PC. The PC has a keyboard controller which converts the received scan code into a specific character. 2. The mouse Mouse controls movement of pointer on screen. When a mouse moves on a flat surface, the cursor on the screen also moves in the direction of mouse's movement. 3. Touch screens Touch screens are used to choose options, which are displayed on screen. In touch screen, a grid of light beams or fines wires criss-cross the compiler screen. When you touch the screen with your finger, the rays are blocked and the computer senses where you have pressed and thereby identifies the object which you want to choose.
29	What are VDU and LCD?
ans:	VDU –Stands for "Visual Display Unit." A VDU displays images generated by a computer or other electronic device. LCD –Stands for "Liquid Crystal Display." LCDs are super-thin displays that are used in laptop computer screens and flat panel monitors.
30	What is plotter? What is principal use?
Ans:	A plotter is an output peripheral device used with a computer that can be likened to a printer. However instead of printing text or images, a plotter is more usually used to draw up technical plans and blueprints.
31	Name three types of output devices. In each case briefly describe the purpose of the device and how it is operated.
Ans:	Following are the three types of output devices: 1. Monitors: It displays text and graphics in a wide range of colours. It is the most common form of output from a computer. It displays information in a similar way to that shown on television screen. 2. Speakers: speakers received the sound in form of electric current form the sound card and then convert it to

	sound format. Speakers receive constantly changing electric current form sound card. This current is transferred to a magnet which pushes the speaker core back and forth. These way pressure vibrations are generated that create sound. 3. Printers: Printers can produce text and images on paper. Many printers are local peripherals connected directly to a nearby personal computer. Individual printers are often designed to support both local and network connected users at the same time.															
32	Writ brief notes on each of the following types of printer. Make clear the differences between them in terms of speed, cost and method of operation, and suggest suitable applications. (a) Inkjet printer (b) Dot matrix printer (c) Laser printer.															
Ans:	<table><tr><th>Inkjet printer</th><th>Dot matrix printer</th><th>Laser printer</th></tr><tr><td>An inkjet printer is Non-Impact printer.</td><td>A dot matrix printer is an Impact printer.</td><td>Laser printer is non-impact printer.</td></tr><tr><td>Speed –Fast compared to a Dot Matrix printer.</td><td>Speed –Very slow (can be less than 100 characters per minute)</td><td>Speed –Very fast (10-20 ppm (pages per minute) for multiple copies.)</td></tr><tr><td>Cost –Cheap to buy</td><td>Cost –Low operating cost.</td><td>Cost – Low cost per page (compared to inkjet printers)</td></tr><tr><td>Method of operation – An inkjet printer is any printer that fires extremely small droplets of ink onto paper to create impression of text or images.</td><td>Method of operation – In DMPs, the printing head contains a vertical array of pins. As the head moves across the paper, selected pins fire against an inked ribbon to form a pattern of dots on the paper.</td><td>Method of operation –These printers make use of office copier technologies. The desired output images is written on a copier drum with the help of a light beam controller by a computer.</td></tr></table>	Inkjet printer	Dot matrix printer	Laser printer	An inkjet printer is Non-Impact printer.	A dot matrix printer is an Impact printer.	Laser printer is non-impact printer.	Speed –Fast compared to a Dot Matrix printer.	Speed –Very slow (can be less than 100 characters per minute)	Speed –Very fast (10-20 ppm (pages per minute) for multiple copies.)	Cost –Cheap to buy	Cost –Low operating cost.	Cost – Low cost per page (compared to inkjet printers)	Method of operation – An inkjet printer is any printer that fires extremely small droplets of ink onto paper to create impression of text or images.	Method of operation – In DMPs, the printing head contains a vertical array of pins. As the head moves across the paper, selected pins fire against an inked ribbon to form a pattern of dots on the paper.	Method of operation –These printers make use of office copier technologies. The desired output images is written on a copier drum with the help of a light beam controller by a computer.
Inkjet printer	Dot matrix printer	Laser printer														
An inkjet printer is Non-Impact printer.	A dot matrix printer is an Impact printer.	Laser printer is non-impact printer.														
Speed –Fast compared to a Dot Matrix printer.	Speed –Very slow (can be less than 100 characters per minute)	Speed –Very fast (10-20 ppm (pages per minute) for multiple copies.)														
Cost –Cheap to buy	Cost –Low operating cost.	Cost – Low cost per page (compared to inkjet printers)														
Method of operation – An inkjet printer is any printer that fires extremely small droplets of ink onto paper to create impression of text or images.	Method of operation – In DMPs, the printing head contains a vertical array of pins. As the head moves across the paper, selected pins fire against an inked ribbon to form a pattern of dots on the paper.	Method of operation –These printers make use of office copier technologies. The desired output images is written on a copier drum with the help of a light beam controller by a computer.														
33	(a) What is an impact printer? (b) Discuss the working of dot matrix printer.															
Ans:	(a) An impact printer is a printing device typically used in conjunction with a computer that allows the relatively rapid and repeatable printing of visual materials. (b) In DMPs, the printing head contains a vertical array of pins. As the head moves across the paper, selected pins fire against an inked ribbon to form a pattern of dots on the paper.															
34	(a) What is non-impact printer? (b) Identify and discuss the ink-jet approach to non-impact printing. (c) How do low-speed laser printers operate?															
Ans:	(a) The natural limitations of speed in electromechanical devices and cost considerations have led to the development of printers called non-impact printers. (b) An inkjet printer is any printer that fires extremely small droplets of ink onto paper to create impression of text or images. The inkjet printers direct a high-velocity stream of ink toward the paper. (c) Low speed laser printers prints very slowly so it takes more time to print same number of pages comparatively with high speed laser printer.															
35	How many the following be used: (a) A track ball? (b) Alight pen? (c) A graphic tablet (d) A touch screen (e) CD-ROM (f) DVDs															
Ans:	(a) A track ball: Useful for playing games on computers. (b) A light pen: Useful for programs like CAD (computer Aided Design) for changing shape, size, location, colours etc. of the screen image. (c) A graphic tablet: Useful in environments involving move of drawing etc. (e.g. Fashion Designing, Art etc.) (d) A touch screen: It is used to choose options, which are displayed on screen. They are often used as input devices in public place such as ATM, Airports, and Travel Agencies etc. (e) CD-ROM: This is used only to store information. Manufacturer use CDROMs to record information including															

	text, graphics or audio on the CD distribution e.g., encyclopedias, software, games, e-books etc. (f) DVDs: DVD can be used to view DVD Movies, install large applications, and to access a large amount of files.		
36	What is control bus? How is it different from other buses?		
Ans:	A control bus is (part of) a computer bus, used by CPUs for communicating with other devices within the computer.		
	Control Bus	Data Bus	Address Bus
	Microprocessor uses control bus to process data, that is what to do with the selected memory location.	It is used to transfer data within Microprocessor and Memory/Input or Output devices.	It is a group of wires or lines that are used to transfer the addresses of Memory or I/O devices.
37	Explain the role and purpose of data and address buses.		
Ans:	Address Bus: It is a group of wires or lines that are used to transfer the addresses of Memory or I/O devices. It is unidirectional. The Address bus carries only memory addresses,		
	Data Bus: As name tells that it is used to transfer data within Microprocessor and Memory/Input or Output devices. It is bidirectional as Microprocessor requires sending or receiving data. The data bus also works as address bus when multiplexed with lower order address bus. Data bus carries instructions/data (and not memory addresses).		
38	Why do you think USB ports are popular these days?		
Ans:	We think USB ports are popular these days because it gives you a single, standardization, easy-to-use way to connect a variety of devices to a computer. These devices include printers, scanners, mice, joystick, digital camera, web cameras, speakers, telephones, zip drives, network connections, scientific data acquisition devices, etc.		
39	What is difference between serial and parallel ports?		
Ans:	Serial Ports		Parallel Ports
	A serial port can transfer information both to and from a hard drive.		A parallel port is only able to transfer information from the hard drive.
	In serial ports, there will be two data lines: One transmission and one receive line. To send a data in serial port, it has to be sent one bit after another with some extra bits like start bit, stop bit and parity bit to detect errors.		In parallel port, all the 8 bits of a byte will be sent to the port at a time and an indication will be sent in another line. There will be some data lines, some control and some handshaking lines in parallel port.
	Serial ports are slower compared to the Parallel port.		Parallel ports are easy to program and faster compared to the serial ports.
40	What is networking port? Name some well-known ports with their port number.		
Ans:	A network port is an address (16-bit address) within a computer, usually associated with a particular application protocol.		
	Well-known ports with their port number		
	Port	Protocol	
	21	File Transfer Protocol	
	23	Telnet Protocol	
	25	Simple Mail Transfer Protocol	
	80	Hypertext Transfer Protocol	
41	What is phone port?		
Ans:	A phone port is a port that allows connecting telephone equipment with the computer's sound card. It simulates analog telephone line digitally.		
42	What is memory card? Discuss briefly its types.		
Ans:	A memory card is a small storage medium used to store data such as text, pictures, audio, and video, for use on small, portable or remote computing devices.		
	Following are the types of memory card:		
	1. Smart Media card		
	Smart Media cards are removable flash memory cards that can be used in several different types of digital devices, including digital cameras, digital music players, cellular phones, pagers, and digital voice recorders.		
	2. Extreme Digital (xD) card		
	An extreme digital card is able to read and write data faster than any other storage media and yet is more		

economical with battery power. Extreme cards are designed to operate in a wide temperature range from -25 to 85 degrees Celsius.

3. MultiMediacard (MMC)

Weighing less than two grams and smaller than a postage stamp, MultiMedia cards are suitable for portable devices like digital audio players, digital cameras, and PDAs. Their low power draw makes them highly suitable for battery-powered mobile applications.

4. Secure Digital card (SD card)

Secure Digital card is basically the second generation MultiMediaCard. A Digital card is a highly secure and reliable small flash memory card with a mechanical write protection switch. Data transfer and physical size re based on the MultiMedia card standard.

5. Compact Flash cards

Compact Flash is the de facto standard to flash memory storage. It is used everywhere from digital cameras to MP3 players to embedded systems.

6. Memory stick

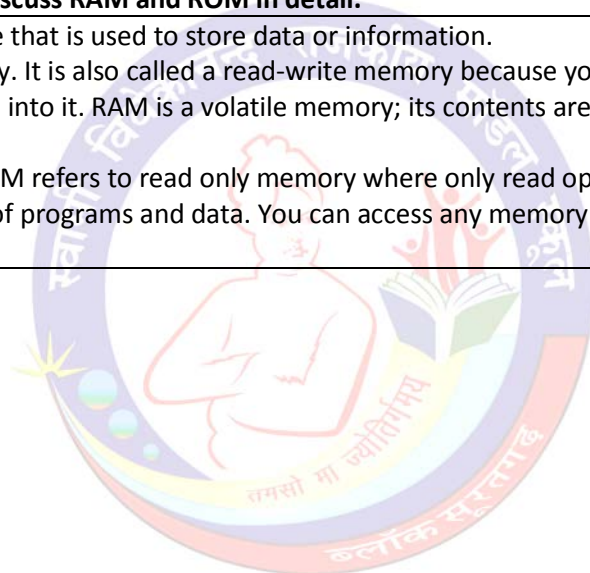
This memory card with thin design is ideal for use in small digital AV electronics products, such as camcorders, and digital still cameras. Memory sticks are high capacity and high performance memory cards.

TYPE C: Long Answer Questions

1	What is computer? Explain its basic architecture along with the functioning of each of its subunit.
Ans:	<pre> graph LR Input[INPUT UNIT] --> CPU[CENTRAL PROCESSING UNIT (CPU)] CPU --> Output[OUTPUT UNIT] CPU <--> Memory[MAIN MEMORY] CPU <--> Storage[(Storage Devices)] </pre> Computer follows input-process-output cycle, the first stage is performed in computer by input unit, second stage is performed by its central processing unit and the third stage is performed by output unit. Thus the basic structure of computer is as shown below. 1. Input Unit The input unit is formed by the input devices attached to the computer. Example of input devices and media are: keyboard, mouse, magnetic ink character reader (MICR), optical mark reader (OMR), optical character reader (OCR), joystick etc. 2. Central Processing Unit (CPU) The CPU is the control center for a computer. It guides, directs and governs its performance. It is the brain of the computer. The CPU has two components which are responsible for different functions. These two components are its Control Unit (CU) and Arithmetic Logic Unit (ALU). ↪ Control Unit (CU) –The CU controls and guides the interpretation, flow and manipulation of all data and information. ↪ Arithmetic Logic Unit (ALU) –The ALU performs all the four arithmetical (+, -, *, /) and some logical (<, >, =, <=, >=, <>) operations. 3. Output Unit The output unit is formed by the output devices attached to the computer. The output coming from the CPU is in the form of electronic binary signals which needs conversion in some form which can be easily understood by human beings i.e., characters, graphical or audio visual. This function of conversation is performed by output units. Some popular output devices are VDU (Visual Display Unit), printer, plotter,

	speech synthesizer and coder etc. 4. The Memory The memory of computer is often called main memory or primary memory. It is generally the third component of CPU. The memory of computer is more like a predefined working place, where it temporarily keeps information and data to facilitate its performance. When the task is performed, it clears its memory and memory space is then available for the next task to be performed. When the power of is switched off, everything stored in the memory gets erased and cannot be recalled.
2	What do you understand by the term 'hardware' and 'software'? What is their significance? Classify software into its component softwares and give examples of each subtype of software
Ans:	Hardware: These are the physical or tangible components of a computer. Hardware provides the basic computing resources. Software: It is a set of programs required to run the hardware and govern the system operations. Software is the easiest way for users to interact with the hardware of a system. Software can be classified into three categories: 1. Operating System – An operating system is a program which acts as an interface between a user and the hardware (i.e., all computer resources). It loads necessary programs (into the computer memory) which are required for proper computer functioning. Examples of operating system are: Single user, multiuser, batch processing, multiprocessing etc. 2. Language processors – It Process an HLL (High Level Language) program so as to make it understandable to the computer. Examples of Language processor are: Interpreter, compiler, assembler. 3. Application software – These are the programs written by the programmers to enable computer to perform a specific task such as inventory control, medical accounting, financial accounting, result preparation, railway reservation, billing etc. Examples of application software are: customized software, general software.
3	What is the contribution of computers towards our society? What are the advantages and disadvantages of computer data processing over manual data processing?
Ans:	Computers can do a lot of different tasks such as playing games, railway reservation, weather forecasting, error detection and controlling the flight of space aircraft etc. Advantages: 1. Speed. 2. High storage capacity. 3. Accuracy. 4. Reliability. 5. Versatility. Disadvantages: 1. Lack of Decision Making Power. 2. IQ Zero.
4	Why is input unit needed in a computer? Discuss various types of input devices along with their working mechanism.
Ans:	An input unit takes the input and converts it into binary form so that it can be understood by the computer. Following are the Input Devices: 1. The keyboard An important data entry device is the keyboard, which is a typewriter like device. Internally, a keyboard contains a matrix of switches and a keyboard controller. When you press a key, its switch gets pressed and when you release a key, its switch gets released. Through pressing and releasing of switches, keyboard controller generates a scan code using a firmware look up table. This scan code is sent to PC. The PC has a keyboard controller which converts the received scan code into a specific character. 2. The mouse Mouse controls movement of pointer on screen. When a mouse moves on a flat surface, the cursor on the screen also moves in the direction of mouse's movement. 3. Touch screens

	Touch screens are used to choose options, which are displayed on screen. In touch screen, a grid of light beams or fines wires criss-cross the compiler screen. When you touch the screen with your finger, the rays are blocked and the computer senses where you have pressed and thereby identifies the object which you want to choose.
5	What is the role of an output unit? Discuss various types of output devices along with their working mechanism.
Ans:	The output coming from the CPU is in the form of electronic binary signals which needs conversion in some form which can be easily understood by human beings i.e., characters, graphical or audio visual. This function of conversation is performed by output units. Following are the types of output devices: 1. Monitors: It displays text and graphics in a wide range of colours. It is the most common form of output from a computer. It displays information in a similar way to that shown on television screen. 2. Speakers: speakers received the sound in form of electric current form the sound card and then convert it to sound format. Speakers receive constantly changing electric current form sound card. This current is transferred to a magnet which pushes the speaker core back and forth. These way pressure vibrations are generated that create sound. 3. Printers: Printers can produce text and images on paper. Many printers are local peripherals connected directly to a nearby personal computer. Individual printers are often designed to support both local and network connected users at the same time.
6	What are memory devices? Discuss RAM and ROM in detail.
Ans:	A memory device is any device that is used to store data or information. RAM –Random Access Memory. It is also called a read-write memory because you can read the contents of a memory location or write new contents into it. RAM is a volatile memory; its contents are lost when power is turned off. It is part of primary memory. ROM –Read-Only Memory. ROM refers to read only memory where only read operation can take place. This device provides non-volatile storage of programs and data. You can access any memory location by supplying its address. It is part of primary memory.



Chapter 2 - Software Concepts

Type A: Very Short Answer Questions

1.	Differentiate between hardware and software.
Ans	Hardware are the physical tangible components of a computer system whereas, Software are the computer programs that govern the operation of computers.
2	How can computer software be classified?
Ans	Computer software can be classified into two categories. 1. System software 2. Application software.
3	What are two categories of system software?
Ans	1. Operating system 2. Language processor
4	What is an operating system? What is its role?
Ans	An operating system is a program which acts as an interface between a user and the hardware. It makes the computer system convenient to use and use computer hardware in an efficient manner.
5	Name various types of operating systems.
Ans	1. Single program OS. 2. Multiprogram OS. 3. Time Sharing OS. 4. Real Time OS. Multiprocessing OS.
6	Name various language processors.
Ans	1. Assembler 2. Interpreter 3. Compiler.
7	What is application software? What are three categories of application software?
Ans	Application software is the set of programs necessary to carry out operations for a specified application. Following are the three categories of application software: 1. Packages 2. Utilities 3. Customised software 4. Developer tools
8	Compare packages and utilities.
Ans	General application softwares are known as packages. Some of the packages are: word processor, spreadsheets, graphics etc whereas, utility programs assist the computer in maintaining its performance. Some of the utilities are: text editors, backup utilities, antivirus software.
9	Differentiate between a compiler and interpreter.
Ans	A compiler converts an HLL program in machine language in one go whereas, an interpreter converts an HLL program into machine language line by line and simultaneously executes the converted line.
10	What are developer tools? Name a few.
Ans	Some most commonly used developer tools are : 1. Compiler 2. Interpreters 3. Integrated Development Environment (IDE).
11	What is an IDE?
Ans	IDE (Integrated Development Environment) is an application program consisting of different development tools needed for developing an application.
12	What is a virus? What is anti-virus software?
Ans	Viruses are malicious codes/programs that cause damage to data and files on a system. Anti-virus software is a software utility that detects, prevents, and removes viruses, worms, and other malware from a computer

Type B: Short Answer Questions

1	What is system software? What role does it play in functioning of the computer?												
Ans	The software that controls internal computer operations is called System software. The software that controls internal computer operations (viz. reading data from input devices, transmitting processed information to the output devices, checking system components, converting data/instructions to computer understandable from etc.)												
2	How are following operating systems different from one another? (i) Multiprogramming OS and multiprocessing OS (ii) Time sharing OS and real time OS.												
Ans	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;">(i) Multiprogramming OS and multiprocessing OS</td><td style="width: 50%; text-align: center;">Multiprocessing OS</td></tr> <tr> <td style="text-align: center;">Multiprogramming OS</td><td style="text-align: center;">Multiprocessing OS</td></tr> <tr> <td style="vertical-align: top;">A multiprogramming operating system allows shared use of the processor or processors that is it emulates a multi processor machine.</td><td style="vertical-align: top;">A multiprocessing operating system is an operating system that can utilize multiple processors.</td></tr> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;">(ii) Time sharing OS and real time OS</td><td style="width: 50%;"></td></tr> <tr> <td style="text-align: center;">Time sharing OS</td><td style="text-align: center;">Real time OS</td></tr> <tr> <td style="vertical-align: top;">This OS uses the time sharing technique.</td><td style="vertical-align: top;">In real time OS, the jobs have fixed deadlines and the jobs have to be completed within their deadlines.</td></tr> </table>	(i) Multiprogramming OS and multiprocessing OS	Multiprocessing OS	Multiprogramming OS	Multiprocessing OS	A multiprogramming operating system allows shared use of the processor or processors that is it emulates a multi processor machine.	A multiprocessing operating system is an operating system that can utilize multiple processors.	(ii) Time sharing OS and real time OS		Time sharing OS	Real time OS	This OS uses the time sharing technique.	In real time OS, the jobs have fixed deadlines and the jobs have to be completed within their deadlines.
(i) Multiprogramming OS and multiprocessing OS	Multiprocessing OS												
Multiprogramming OS	Multiprocessing OS												
A multiprogramming operating system allows shared use of the processor or processors that is it emulates a multi processor machine.	A multiprocessing operating system is an operating system that can utilize multiple processors.												
(ii) Time sharing OS and real time OS													
Time sharing OS	Real time OS												
This OS uses the time sharing technique.	In real time OS, the jobs have fixed deadlines and the jobs have to be completed within their deadlines.												
3	Write short notes on the following: (i) Wordprocessor (ii) Electronic spreadsheet (iii) dbms (iv) Graphic, multimedia and presentation software (v) DTP software.												
Ans	(i) Wordprocessor –It is a package that process textual matter and creates organized and flawless documents. Following are some features of Wordprocessor: - Word processors provide variety of fonts and print styles. - Information can be saved for later use. - Word processors provide the facility of spell-check, dictionary and thesaurus. - Word processors offer very useful utility known as mail-merge. (ii) Electronic spreadsheet –An electronic spreadsheet is a program that accepts data in a tabular form (in row and columns) and allows users to manipulate/ calculate/ analyze data in the desired manner. following are some useful features of electronic spreadsheets are: - Spreadsheets cannot only represent data values but also their relationships. - Spreadsheets provide facilities of cutting, pasting, moving, copying data values or formulae or formats etc. - Numerous built-in functions are available in spreadsheets. - Data can graphically be represented through charts/graphs of many types. (iii) dbmd –DBMS is an acronym for Data Base Management System. A dbms is software that can effectively store, manipulate, and handle bulk of data. A dbms provides utilities for data analyses and data based management. (iv) Graphics, multimedia and presentation software –The application software that manipulates images is known as Graphic Software and the software that incorporates images, text, sound, computer animation, and video sequences is known as multimedia software. The application software that can create professional looking visual aids is called presentation Graphics Software. Some most popular graphics, multimedia and presentation packages are Coreldraw, Macromedia®, Power point etc. (v) DTP software –The software that handles page layout by combining the functions of a traditional												

	typesetter and a layout artist, is known as Desktop Publishing Software . The design and layout of complete book or journal can be achieved without much trouble using a suitable DTP package.
4	Discuss the role of utility software in the context of computer performance.
Ans	utilities are those application programs that assist the computer by performing housekeeping functions like backing up disk or scanning/cleaning viruses or arranging information etc.
5	Why is disk Defragmentor useful?
Ans	Disk Defragmentor speeds up disk access by rearranging the files and free space on your computer; so that files are stored in contiguous units and free space is consolidated in one contiguous block.
6	How is backup utility useful? Is it necessary to take backup of data?
Ans	The files or folders or even drives can be backed up using this utility. You can back up files to floppy disks, a tape drive or even on another computer on your network. Yes it is necessary to take backup of data because in case of any damage or data-loss, this backed up data may be used.
7	What is a computer virus? How can it affect your computer?
Ans	Computer viruses are malicious codes/programs that cause damage to data and files on a system. Viruses damage or delete files, slow down your computer and invade your email program.
8	Why are antivirus software considered important?
Ans	Antivirus software considered important because it scans your disk for viruses and removes them, if any virus is found. Moreover, some antivirus software remains present in memory all the time so that they can detect the viruses and counterattack them.
9	Why do think IDEs are useful in application development?
Ans	IDEs are useful in application development because it consists source code editor, compiler, debugger, graphical user interface (GUI) builder, build automation tools, and code generator.
10	What are different types of threats to computer security?
Ans	Following are the types of threats to computer security: 1. Viruses ↳ Worms ↳ Trojans 2. Spyware 3. Adware 4. Spamming 5. PC Intrusion ↳ Denial of service ↳ Sweeping ↳ Password Guessing 6. Phishing.
11	What type damages can be caused by viruses to you computer?
Ans	↳ Damages or delete files. ↳ Slow down your computer. ↳ Invade your email program.
12	What are Malware? What type of damages can they cause to your computer?
Ans	Malware is a general term used to refer to viruses, worms, spyware, adware etc. ↳ Damages or delete files. ↳ Slow down your computer. ↳ Invade your email program.
13	What is spam? Why has it become a big Internet issue?
Ans	Spamming refers to the sending of bulk-mail by an identified or unidentified source. It has become a big internet issue because bulk-advertising mail is sent to many accounts.
14	What do you understand by PC intrusion?
Ans	Intrusion is the term used when an unauthorized third party gains access to your PC. Generally via the Internet. PC Intrusion can occur in any of the following form: 1. Sweeper Attack

	2. Denial of Services 3. Password Guessing.
15	What measure would you take to avoid: (i) Virus attack (ii) Spyware (iii) Adware (iv) Spam (v) PC intrusion
Ans	(i) Virus attack –Use Anti-Virus (ii) Spyware –Use Anti-Spyware software. (iii) Adware –Download updates regularly. (iv) Spam –use Anti-spam software. (v) PC Intrusion –Firewall.
16	What are denial-of-service and Sweeper attacks?
Ans	Denial of Services –This type of attack eats up all the resources of a system and the system or applications come to a half. Example of such an attack is flooding a system with junk mail. Sweeper Attack –This is another malicious program used by hackers. It sweeps i.e., deletes all the data from the system.
17	What is Phishing?
Ans	Phishing is the criminally fraudulent process of attempting to acquire sensitive information pertaining to a user.

TYPE C: Long Answer Questions

1	Discuss different types of utility software.
	Following are the different types of utility software: 1. Text Editor –This utility program is used for creating, editing text files. Text Editor Software supports special command for text editing i.e., you can insert, delete, find, replace characters, lines and paragraphs etc. 2. Backup Utility –This utility program facilitates the backing-up of disk. The files or folders or even drives can be backed up using this utility. You can back up files to floppy disks, a tape drive or even on another computer on your network. 3. Compression Utility –This utility program facilitates compression of files. Large files can be compressed so that they take less storage area. When needed, these compressed files can be exploded back to their original form. 4. Disk Defragmentor –This utility program attempts to minimize the fragmentation on your disk. Disk Defragmentor speeds up disk access by rearranging the files and free space on your computer, so that files are stored in contiguous units and free space is consolidated in one contiguous block. 5. Antivirus Software –This utility program ensures virus-free work environment. Antivirus software scans your disk for viruses and removes them, if any virus found. Moreover, some antivirus software remains present in memory all the time so that they can detect the viruses and counterattack them.
2	What do you understand by computer security, various threats to computer security and possible solutions to computer security?
Ans	Computer security is the ability of a system to protect information and system resources with respect to confidentiality and integrity. Various threats to computer security with solution 1. Viruses, Spyware, Adware: ↪ Active protection Use Anti-Virus and Anti-Spyware software. Download Updates regularly. Run frequent full-system scans. ↪ Preventive measures Keep your system up-to-date. Use caution when downloading files on the internet.

	Be careful with email. 2. Spam: ↪ Active protection Use Anti-spam software. ↪ Preventive Measures Keep your email address private. Use alternate style of writing your email addresses on the web. 3. PC Intrusion ↪ Active protection Authorization Authentication Firewall ↪ Preventive Measures Use proper file access permissions when sharing files on the internet. Disconnect from the internet when away.
--	--

