



**MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION**  
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**WINTER – 2018 EXAMINATION**  
**MODEL ANSWER**

**Subject: Computer Hardware and Maintenance**

**Subject Code:** 17428

**Important Instructions to examiners:**

- 1) The answers should be examined by key words and not as word-to-word as given in the model answer scheme.
- 2) The model answer and the answer written by candidate may vary but the examiner may try to assess the understanding level of the candidate.
- 3) The language errors such as grammatical, spelling errors should not be given more Importance (Not applicable for subject English and Communication Skills).
- 4) While assessing figures, examiner may give credit for principal components indicated in the figure. The figures drawn by candidate and model answer may vary. The examiner may give credit for any equivalent figure drawn.
- 5) Credits may be given step wise for numerical problems. In some cases, the assumed constant values may vary and there may be some difference in the candidate's answers and model answer.
- 6) In case of some questions credit may be given by judgement on part of examiner of relevant answer based on candidate's understanding.
- 7) For programming language papers, credit may be given to any other program based on equivalent concept.

Q. No	Sub Q.N.	Answer	Marking Scheme
1.	a) (i) Ans.	<p><b>Attempt any <u>SIX</u> of the following:</b></p> <p><b>State any two motherboard selection criteria.</b></p> <p><b>Motherboard Selection Criteria:</b></p> <p><b>1. Motherboard Chipset:</b> Motherboard should use a high performance chipset that supports DDR or DDR2 SDRAM DIMMs. It should also support PCI- Express X16 video support and Serial ATA or faster hard drive support.</p> <p><b>2. Processor:</b> A modern system should use a socket based processor with on-die L2 cache. The processor should have highest speed CPU bus (Front Side Bus: FSB).</p> <p><b>3. Motherboard Speed:</b> 200MHz to 400MHz for Duron/Athlon/Athlon XP –based boards and 400MHz to 1066MHz for Pentium 4 based boards.</p> <p><b>4. Processor Sockets:</b> For maximum upgradability and performance, a socket based system should be used. The main sockets used are</p>	<p><b>12</b> <b>2M</b></p> <p><i>Any two selection criteria</i> <i>1M each</i></p>



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		<p>Socket A(Socket 426) for Athlon XP and Socket 775 for Pentium 4.</p> <p><b>5. Cache Memory:</b> Use a processor with full core speed on-die L2 cache as it offers maximum in performance.</p> <p><b>6. SIMM/DIMM/RIMM memory:</b> Current systems use either DDR or DDR2 DIMMs. Currently DDR and DDR2 SDRAM and RDRAM are the fastest type of memory available, with RDRAM being by far the most costly.</p> <p><b>7. Bus Type:</b> Current systems offer PCI as well as PCI Express slots. PCI slots should conform with PCI 2.1 or later revision. Systems without on-board video should also feature PCI Express X 16 slot.</p> <p><b>8. Basic Input Output System (BIOS):</b> The motherboard should use industry standard BIOS such as those from AMI, Phoenix or Award. The BIOS should be of a flash ROM or EEPROM design for easy updating.</p> <p><b>9. Form Factor:</b> For maximum flexibility, performance, reliability and ease of use, motherboard with ATX form factor should be used.</p> <p><b>10. Built-in Interfaces:</b> The motherboard should contain as many built-in standard controllers and interfaces as possible.</p> <p><b>11. On-board IDE interfaces:</b> It should be included on the motherboard.</p> <p><b>12. Power Management:</b> The motherboard should support the latest standard for power management which is ACPI.</p>	
	(ii) Ans	<p><b>What is track and sector of H.D.D?</b></p> <p><b>Track:</b></p> <ul style="list-style-type: none"> <li>• Each side of HDD platters surface is divided into concentric circles called tracks</li> <li>• They are magnetic information written during formatting of HDD</li> <li>• Outermost track is called track 0. The innermost will have the highest number.</li> </ul>	<p><b>2M</b></p> <p><i>Each term 1M</i></p>

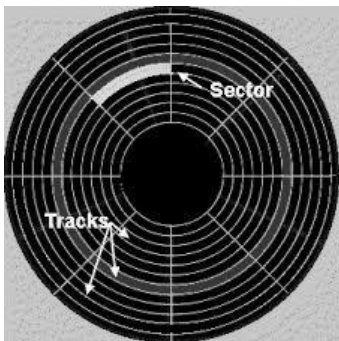


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		 <p><b>Sector:</b></p> <ul style="list-style-type: none"> <li>• A track is a big area to store data (5000 bytes). Hence tracks are divided into sectors.</li> <li>• The formatting program divides disk surface into sectors by writing magnetic pattern on disk surface.</li> <li>• Different HDD capacities have different number of tracks and sectors.</li> <li>• 512 byte data can be stored in each sector. Sector no. starts from 1.</li> </ul>	
	(iii) Ans	<p><b>Write any four advantages of CRT display over LCD display.</b></p> <p><b>Advantages of CRT display over LCD display:</b></p> <ol style="list-style-type: none"> <li>1. CRT monitors cost less than LCDs.</li> <li>2. CRT monitors represent colours and different generations of colours better than LCD monitors.</li> <li>3. CRT monitors can handle multiple resolutions, LCD monitors do not.</li> <li>4. CRT monitors are more robust than LCD monitors.</li> <li>5. CRT Produces a very dark black and the highest contrast levels normally available. Suitable for use even in dimly lit or dark environments.</li> </ol>	<p><b>2M</b></p> <p><i>Any four advantages 1/2 M each</i></p>
	(iv) Ans	<p><b>Give classification of printer with example.</b></p> <p><b>Classification of Printer</b></p> <p><b>Based on Printer Mechanism</b></p> <ol style="list-style-type: none"> <li>1. Impact             <ol style="list-style-type: none"> <li>i. Dot Matrix</li> <li>ii. Line</li> </ol> </li> </ol>	<p><b>2M</b></p>



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		<p>iii. Drum</p> <p><b>2. Non-Impact</b></p> <p>i. Inkjet</p> <p>ii. Thermal</p> <p>iii. Laser</p> <p>iv. Thermal-wax transfer</p> <p>v. Thermal-wax transfer</p> <p><b>OR</b></p> <p><b>Based on image formation method</b></p> <p><b>1. Fully formed character</b></p> <p>i. Daisy wheel</p> <p>ii. Line</p> <p>iii. Drum</p> <p><b>2. Bit Image</b></p> <p>i. Dot Matrix</p> <p>ii. Inkjet</p> <p>iii. Thermal</p> <p>iv. Laser</p> <p>v. Thermal-wax transfer</p> <p>vi. Thermal – dye diffusion</p>	<p><i>Any two classification 1M each</i></p>
	<p>(v)</p> <p><b>Ans</b></p>	<p><b>Give advantages of ink jet printer over dot matrix printer (any two)</b></p> <p>Advantages of inkjet printer over dot matrix printer.</p> <p>1. Silent in operation.</p> <p>2. High quality output.</p> <p>3. Support colour printing.</p> <p>4. High Speed.</p>	<p><b>2M</b></p> <p><i>Any two Advantages 1M each</i></p>
	<p>(vi)</p> <p><b>Ans</b></p>	<p><b>Define:</b></p> <p><b>(1) Black out</b></p> <p><b>(2) Spikes</b></p> <p><b>(1) Black out:</b></p> <p>a. A blackout is complete loss of electric power where voltage and current drop to almost 0</p> <p>b. Blackout is usually caused by physical interruption in the power</p>	<p><b>2M</b></p> <p><i>Defining each term</i></p>



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		line due to accidental damage by a person or act of nature.  <b>(2) Spikes:</b> a. A spike is a large over voltage condition that occurs in the milliseconds. b. Lightning strikes and high energy switches can cause spikes on the AC line. c. Heavy equipment like drill machine, grinders, welding equipment etc. can produce power spikes.	<b>1M</b>
	<b>(vii) Ans</b>	<b>List any four fire wire features.</b> <b>Features of FIREWIRE:</b> 1. Hot plug-ability. 2. Multiple devices up to 63. 3. Uses daisy chain topology 4. Data Transfer Rate 400/ 800 Mbps 5. Snap connection: no need for device ID, jumper, DIP switch, terminators etc. 6. Power sourcing. 7. Dynamic reconfiguration. 8. Max distance between devices: 4.5m 9. Supports DMA transfers 10. Well suited for different devices such as Digital Camera, Scanner, HDD, printers, music systems.	<b>2M</b>  <i>Any four features ½ M each</i>
	<b>(viii) Ans</b>	<b>Give four features of USB</b> <b>Features of USB:</b> 1. Up to 127 different devices can be connected on a single USB bus. 2. Initial USB standard supported 12 Mbps transfer rate. Currently 60 Mbps is supported. 3. Supports wide range of peripherals such as keyboard, mouse, printer, FDD, game pad, joystick etc. 4. Devices are not daisy chained. Each device is connected to USB hub, which is an intelligent device interacting with the PC on one side and USB peripheral devices on the other side. 5. A USB device can be connected without powering off the PC. The plug and play feature in the BIOS together with intelligence in the USB device takes care of detection, device recognition and handling. 6. USB controller in the PC detects the presence or absence of USB devices and does power allocation.	<b>2M</b>  <i>Any four features ½ M each</i>



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		7. The CPU/software initiates every transaction on the USB bus. Hence the overhead on the PC software increases.	
	<b>b)</b> <b>(i)</b> <b>Ans</b>	<p><b>Attempt any <u>TWO</u> of the following:</b></p> <p><b>What is cache memory? What is L1, L2, L3 cache?</b></p> <p><b>Cache Memory:</b> Cache memory is extremely fast memory that is built into a CPU, or located next to it on a separate chip. It supplies the processor with the most frequently requested data and instructions.</p> <p>The CPU uses cache memory to store instructions that are repeatedly required to run programs, improving overall system speed. Static RAM is used as cache memory to improve the speed of computer, and Used in between main memory and processor.</p> <p><i>There are three types of cache memory:</i>  <b>L1, L2 &amp; L3 cache memory.</b></p> <p><b>L1 cache memory:</b> The L1 cache also called <u>internal or integral cache</u> is always a part of the processor chip. L1 cache always runs at full processor speed. L1 cache typically ranges in size from 8KB to 64KB and uses the high-speed SRAM.</p> <p><b>L2 cache memory:</b> The L2 cache originally called <u>external cache</u> because it was external to the processor chip when it was introduced. It is present on the motherboard and runs at CPU bus speed.</p> <p><b>L3 cache memory:</b> L3 cache has come into trend with advent of multi-core CPUs. Whereas these chips will have both L1 and L2 caches each separate core. There is common fairly large L3 shared by all cores. The L3 cache has been present in high end work stations and servers such as Xeon and Itanium.</p>	<p style="text-align: center;"><b>8</b> <b>4M</b></p> <p style="text-align: center;"><i>Cache Memory Explanat ion 1M</i></p> <p style="text-align: center;"><i>L1, L2, L3 Explanat ion 1M each</i></p>

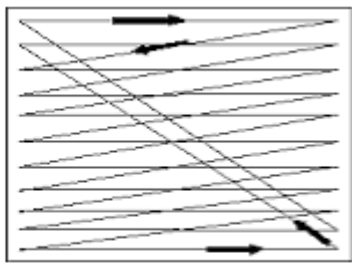
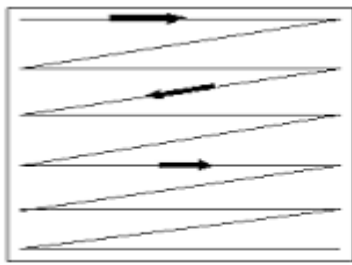


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	<div><div>(ii)</div><div>Ans</div></div>	<div>State any four difference between interlaced and non interlaced monitor.</div> <table><thead><tr><th>Interlaced</th><th>Non - interlaced</th></tr></thead><tbody><tr><td>Scans every other line of the image in one pass &amp; the remaining lines in other pass</td><td>Scans all lines in single pass</td></tr><tr><td>Image Flicker is more</td><td>Image Flicker is less</td></tr><tr><td>Effective image refresh rate is half the vertical scanning rate</td><td>Entire image is refresh at vertical Scanning rate</td></tr><tr><td>This method of scanning is called 2:1 interlaced.</td><td>The effective image refresh rate is only half the stated vertical scanning rate.</td></tr><tr><td>Difficult on the eyes</td><td>Easy on the eyes</td></tr><tr><td>The cost is less</td><td>The cost is more</td></tr></tbody></table> <div><div></div><div></div><div>InterlacedNon-Interlaced</div></div>	Interlaced	Non - interlaced	Scans every other line of the image in one pass & the remaining lines in other pass	Scans all lines in single pass	Image Flicker is more	Image Flicker is less	Effective image refresh rate is half the vertical scanning rate	Entire image is refresh at vertical Scanning rate	This method of scanning is called 2:1 interlaced.	The effective image refresh rate is only half the stated vertical scanning rate.	Difficult on the eyes	Easy on the eyes	The cost is less	The cost is more	<div>4M</div> <div>Any four difference 1M each</div>
Interlaced	Non - interlaced																
Scans every other line of the image in one pass & the remaining lines in other pass	Scans all lines in single pass																
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The cost is less	The cost is more																
	<div><div>(iii)</div><div>Ans</div></div>	<div>Define the following terms related to CRT monitor</div> <div>(1) Frame rate</div> <div>(2) Video band – width</div> <div>(3) Resolution</div> <div>(4) Dot pitch</div> <div>1) Frame Rate : This is used to show the number of times a screen full of information is produced per second or the number of times a frame is shown (in one second) on the monitor. OR Frequency at which whole screen is redrawn.</div> <div>2) Video bandwidth: It is the highest input frequency a monitor can handle and helps in determining the resolution capabilities of the monitor, bandwidth is measured in MHz. Higher the video bandwidth, better the image quality.</div>	<div>4M</div> <div>Defining each term 1M</div>														



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		<p><b>3) Resolution:</b> Resolution describes the number of potential pixels the monitor is capable of displaying. Resolution = Total Horizontal Pixels x Total vertical pixels.</p> <p><b>4) Dot pitch:</b> It is the distance between each group (triad) of red, blue and green phosphors. A smaller dot pitch helps produce sharper and clearer image</p>	
2	<p><b>a)</b> <b>Ans</b></p>	<p><b>Attempt any <u>FOUR</u> of the following</b> <b>State any four features of PCI – X</b> Features of PCI-X</p> <ol style="list-style-type: none"> <li><b>Speed :</b> doubling the maximum clock speed from 66MHz to 133 MHz bus speed</li> <li><b>Bandwidth :</b> 64-Bit bandwidth</li> <li><b>Throughput:</b> 1 GB/sec throughput</li> <li><b>Efficiency:</b> More efficient bus operation for easier interface.</li> <li><b>Split transaction:</b> Split transactions allows an indicator device to make only one data request and relinquish the bus, instead of constantly needing to poll the bus for a response.</li> <li><b>Byte count:</b> Byte count that enables indicator to specify, in advance, the specific number of bytes requested, eliminating the inefficiency of speculative pre-fetches.</li> <li><b>Backward compatibility:</b> PCI-X is backward compatible to PCI.</li> </ol>	<p><b>16</b> <b>4M</b></p> <p><i>Any four</i> <i>Features</i> <i>1M</i> <i>each</i></p>
	<p><b>b)</b> <b>Ans</b></p>	<p><b>Explain the construction of CD-ROM drive with block diagram</b> <b>The Block Diagram of construction of CD-ROM drive consists of</b></p> <ol style="list-style-type: none"> <li>Optical head which contains laser diode, photo detector and beam splitter</li> <li>Disk controller</li> <li>Loading mechanism</li> <li>Servo motor</li> <li>I/O interface</li> </ol>	<p><b>4M</b></p>

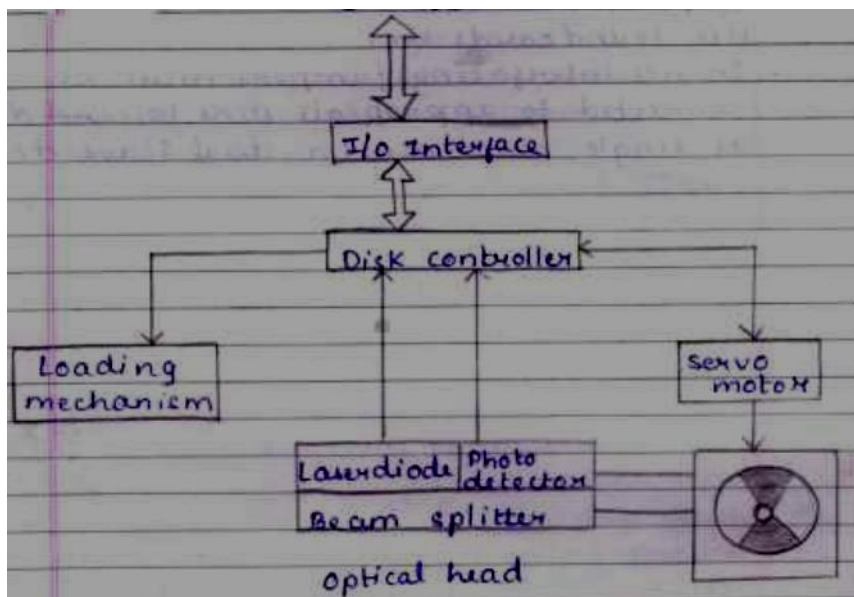




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Block  
Diagram  
2M

Explan  
ation  
2M

**1. Optical head:**

- Laser diode, which generates the laser beam.
- A lens system to focus the laser beam on the disc and to direct the reflected beam on to the photo detector.
- The beam splitter sends the reflected beam towards a different lens for focusing.
- Photo detector that detects the reflected light and converts it into electric pulses.

**2. Disk controller:** Disk controller is the overall controller of the CD drive. It controls the speed of rotation and processes the signals coming from the optical head.

**3. Loading mechanism:** The information coming from the photo detector is in the encoded form (8 to 14 Modulation) (EFM). The decoding of data is done by the microprocessor on the controller.

**4. Servo motor:** Servo motors that control the position of laser and lenses to ensure correct tracking and focusing.



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		<p><b>5. I/O interface:</b> The interface section provides for the transfer of data between the computer and the CD-ROM drive. Many CD-ROM drives are manufactured with the small computer systems interface (SCSI), although some proprietary interface units are available. The decoded data is sent to the I/O interface, which makes it available to the system.</p>	
	<p>c)</p> <p><b>Ans</b></p>	<p><b>What is partitioning of hard disk? How it is done? Give need of partitioning.</b>  <i>Note: Any one method shall be considered</i>  <b>Definition:-</b>            Partitioning is a procedure which divides the hard disk into multiple sections or logical parts or drives. Each partition is comprised of several cylinders or tracks.  <b>Disk partitioning</b> is the creation of one or more regions on a hard disk or other secondary storage, so that an operating system can manage information in each region separately. These regions are called partitions. It is typically the first step of preparing a newly manufactured disk, before any files or directories have been created. Each partition then appears in the operating system as a distinct "logical" disk that uses part of the actual disk.</p> <p><b>Procedure to create partition: -</b></p> <p><b><u>Method 1:( On DOS/ Earlier Windows OS)</u></b></p> <ol style="list-style-type: none"> <li>1. Use fdisk.exe command prompt utility to create partitions.</li> <li>2. Display the current partition information.</li> <li>3. Create a Primary DOS partition.</li> <li>4. Exit FDISK by pressing the Esc key.</li> </ol> <p><b><u>Method 2: (On Latest Windows OS)</u></b></p> <ol style="list-style-type: none"> <li>1. Run diskmgmt.msc utility.</li> <li>2. Select volume which is to be partitioned in small/logical volume.</li> <li>3. Right click and select shrink volume option.</li> <li>4. Set Size and Assign Drive name.</li> <li>5. Format new drive with appropriate file system.</li> </ol>	<p><b>4M</b></p> <p><i>Explanation</i> <b>2M</b></p> <p><i>Procedure</i> <b>1M</b></p>



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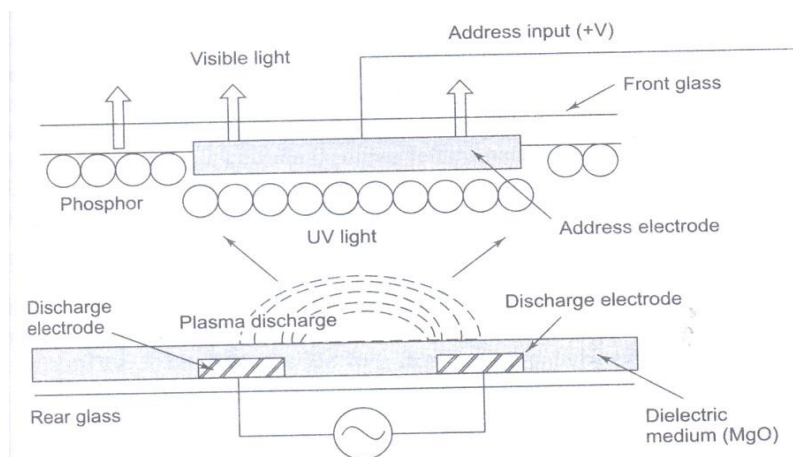
		<p><b><u>Method 3( On Linux using Fdisk)</u></b></p> <ol style="list-style-type: none"><li>1. First create a new partition on your drive with the fdisk/dev/sdbcommand option:</li><li>2. On the next step either press p or press <b>ENTER</b> which takes up the default value p (primary partition).</li><li>3. Next you can choose a partition number for your primary partition.</li></ol> <p><b>Need of partitioning:-</b></p> <ol style="list-style-type: none"><li>1. Different operating systems may be stored on different partitions.</li><li>2. To segregate data as per user choice.</li><li>3. To create separate memory space for back up.</li><li>4. Maximize Hard disk utilization.</li></ol>	<p><i>Need 1M</i></p>
	<p><b>d) Ans</b></p>	<p><b>Describe use of jumper selections. (any four)</b></p> <p>Use of jumper selections :</p> <ol style="list-style-type: none"><li>1. Jumpers allow the computer to close an electrical circuit, allowing the electricity to flow certain sections of the circuit board.</li><li>2. Jumpers are used to configure the settings for computer peripherals such as the motherboard, hard drives.</li><li>3. If motherboard supports intrusion detection, a jumper can be set to enable or disable this feature.</li><li>4. Before Plug-and-Play, jumpers were used to adjust device resources, such as changing what IRQ the device is using.</li><li>5. Jumpers are used to adjust the SCSI ID jumpers on a hard drive (SCSI).</li><li>6. Jumpers are used to set the hard drive (IDE) to work in either master or slave mode.</li></ol>	<p><b>4M</b></p> <p><i>Any four uses 1M each</i></p>
	<p><b>e) Ans</b></p>	<p><b>Explain working of plasma display with diagram</b></p> <p><b>Construction of Plasma Display.</b></p>	<p><b>4M</b></p>



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**Diagram**  
**2M**

**Working of plasma display :**

- Plasma is a state of gas made up of free flowing ions (+ve) and electrons. Under normal conditions a gas is made up of uncharged particles.
- In plasma display xenon and neon atoms are used.
- When an electric current is passed through plasma, the electrons rush towards the positive electrode and ions rush towards the negative electrode.
- During this rush they collide with each other.
- These collisions excite the gas atoms in the plasma, causing them to release photons of energy.
- These are ultraviolet photons invisible to human eye.
- The released ultraviolet photons interact with phosphor material on the inside wall of the cell and phosphors give off colored light.
- Each phosphor has three separate cells, a red, a blue and a green phosphor.
- These colors blend together to create the overall color of the cell.
- The xenon and neon gas in plasma contain hundreds of thousands of tiny cells positioned between two plates of glass.
- Long electrodes are sandwiched between the glass plates on both the sides of the cells.
- The address electrodes are at the rear glass plate and the discharge electrodes are transparent and mounted along the front glass plate.

**Working**  
**2M**



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		<ul style="list-style-type: none"> <li>Both sets of electrodes extend across the entire screen.</li> <li>To ionize the gas in a particular cell, the electrodes that intersect at that cell are charged.</li> <li>When an electric current flows through the gas in the cell, the gas atoms are stimulated and they release ultraviolet photons.</li> <li>By varying the pulses of current flowing through the different cells intensity of each subpixel color can be varied to create hundreds of different combinations of red, green and blue.</li> </ul>	
	<b>f) Ans</b>	<p><b>List any four specification of Dot matrix printer.</b></p> <p><b>1. Speed:</b> Speed of a Dot matrix Printer is defined in cps (characters per second) for e.g., 100-600 characters per second</p> <p><b>2. Type of paper:</b> Type of paper used can be continuous paper or separate paper</p> <p><b>3. Print quality:</b> Print quality depends on number of print pins (from 9 to 24 pins)</p> <p><b>4. Type of interface:</b> Type of interface – is a parallel interface or serial interface (LPT or COM ports)</p> <p><b>5. Line width:</b> Line width is generally 80 characters, or columns, with some dot matrix printers being capable of 132-character lines.</p> <p><b>6. Printer Direction:</b> Printer Direction Bi-directional for text printing and unidirectional for Graphics printing</p>	<p><b>4M</b></p> <p><i>Any four specifications 1M each</i></p>
<b>3</b>	<b>a) Ans</b>	<p><b>Attempt any <u>FOUR</u> of the following</b></p> <p><b>Draw and explain architecture of Intel chipset 915G</b></p> <p>The diagram illustrates the architecture of the Intel 915G chipset. At the top, the Intel Pentium 4 processor (supporting HT Technology) connects to the 82915G GMCH via a 6.4 GB/s link. The GMCH is connected to Intel GMA 900 Graphics (8.0 GB/s) and PCI Express x16 Graphics (8.0 GB/s). It also manages memory, connecting to two channels of DDR/DDR2 at 8.5 GB/s each. The GMCH connects to the ICH6RW via a 2 GB/s DMI link. The ICH6RW manages various I/O functions: Intel High Definition Audio (500 MB/s), 4 PCI Express x1 (500 MB/s), 8 Hi-Speed USB 2.0 Ports (60 MB/s), 4 Serial ATA Ports (150 MB/s), 6 PCI (133 MB/s), Intel Matrix Storage Technology, Intel Wireless Connect Technology, and BIOS Support for HT Technology.</p>	<p><b>16 4M</b></p> <p><i>Diagram 2M</i></p>



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		<p>The 915G chipset enables ultimate flexibility with different system bus speeds, memory configurations, and graphics solutions.</p> <p>The 915G chipset supports 800 MHz and 533 MHz system bus for LGA775 processors, either 333MHz/400MHz DDR memory or 400MHz/533MHz DDR2 memory in single- or dual-channel mode, Intel Graphics Media Accelerator 900 graphics or discrete PCI Express x16 Graphics cards. Intel 915G chipset-based platforms also offer integrated Hi-Speed USB 2.0, High Definition Audio for improved sound quality and new audio usage models.</p> <p>It has enhanced RAID support. The 915G chipset enables lower system price points with graphics and hi-speed USB 2.0 integration.</p> <p>The 915G chipset delivers a complete range of support for the Pentium 4 processor with integration of the enhanced Intel Graphics Media Accelerator 900 core.</p>	<p style="text-align: right;"><b>Explanation</b> <b>2M</b></p>
	<p><b>b)</b></p> <p><b>Ans</b></p>	<p><b>Explain working of touch screen display with diagram.</b> <i>Note: Any other relevant diagram for other types of touch technologies can also be considered.</i></p> <p><b>Touch Screen Display</b> A touch screen is an electronic visual display that can detect the presence and location of a touch within the display area. Touch screens can sense Finger and other passive objects, such as a stylus.</p> <p><b>Components of Touch Screen</b></p> <ol style="list-style-type: none"> <li>1. Touch Sensor</li> <li>2. Controller</li> <li>3. Software driver</li> </ol> <p><b>1. Touch Sensor</b> A touch sensor detects the location of touches within the display area. The sensor has an electrical current or signal going through it and touches the screen can cause a voltage or signal change.</p> <p><b>2. Controller</b> It is PCB that is interface between the sensor and the display. Translates the information so that computer can understand.</p> <p><b>3. Software Driver</b> Allow OS and controller to communicate and helps the controller</p>	<p style="text-align: right;"><b>4M</b></p> <p style="text-align: right;"><b>Explanation</b> <b>2M</b></p>

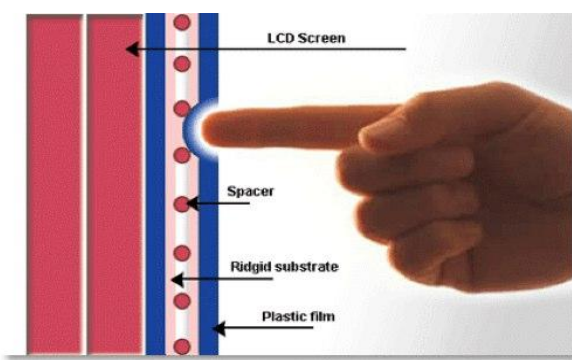


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		<p>recognize input. Most touch screen drivers are a mouse-emulation type driver.</p> <p>There are mainly 4 types of touch Technologies:-</p> <ol style="list-style-type: none"> <li>1. Resistive</li> <li>2. Surface acoustic wave</li> <li>3. Capacitive</li> <li>4. Infrared</li> </ol> <p><b>Resistive touch screen display</b></p> 	<p style="text-align: right;"><i>Diagram</i> <b>2M</b></p>
	<p><b>c)</b> <b>Ans</b></p>	<p><b>Explain in brief SCSI drive configuration</b></p> <p>SCSI drives are complicated when compared with IDE drives while configuring. The SCSI standard controls the way the drives must be set up. Following setup has to be done while configuring SCSI drive:</p> <p><b>SCSI Device ID:</b> Every device on a SCSI bus must be uniquely identified for addressing purposes. Narrow SCSI drives will have a set of three jumpers that can be used to assign the disk an ID number from 0 to 7.</p> <p><b>Wide SCSI drives</b> will have four jumpers to enable ID numbers from 0 to 15. Some systems don't use jumpers to configure SCSI device IDs.</p> <p><b>Termination activate:</b> The devices on the ends of the SCSI bus must terminate the bus for it to function properly. If the hard disk is at the end of the bus, setting this jumper will cause it to terminate the bus for proper operation.</p> <p><b>Disable auto start:</b> When present, this jumper will tell the drive not to</p>	<p style="text-align: right;"><b>4M</b></p> <p style="text-align: right;"><i>Explanation</i> <b>4M</b></p>



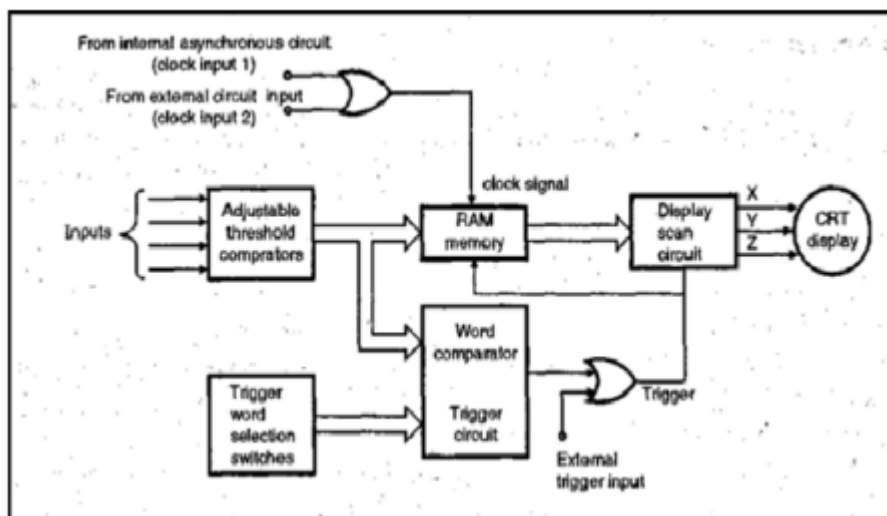
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		<p>automatically spin up when the power is applied but instead wait for a start command over the SCSI bus. This is usually done to prevent excessive startup load on the power supply. If by default startup is disable then it is provided by an “Enable Auto Start” jumper.</p> <p>Stagger spin: An “enhanced version” of “Delay Auto Start”. When a system with many hard drives has this option set for each unit, the drives stagger their startup time by multiplying user-defined constant times their SCSI device ID. This ensures no two drives on the same SCSI will start up simultaneously.</p> <p>Narrow/Wide: Some drives have a jumper to control whether they will function in narrow or wide mode.</p>	
	<p><b>d)</b></p> <p><b>Ans</b></p>	<p><b>Explain the working of logic analyser for troubleshooting of PC with a neat block diagram</b></p> <p><b>Logic Analyzer:</b> A logic analyzer is an electronic instrument that displays signals in a digital circuit that are too fast to be observed and presents it to a user so that the user can more easily check correct operation of the digital system. Fig. shows functional block diagram of logic analyzer. A logic analyzer is a device, which allows you to see the signals on 16 to 64 signal lines at once.</p> <p>It is also called multi-trace digital oscilloscope. It captures and stores several digital signals, letting you view the signals simultaneously</p>	<p><b>4M</b></p> <p><i>Explanation</i> <b>2M</b></p> <p><i>Diagram</i> <b>2M</b></p>







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		<p><b>Working:</b></p> <p>All the input signals are applied to the adjustable threshold comparator one for each channel.</p> <p>Then reference input for each signal can be adjustable depending on logical state of device under testing.</p> <p>The logic analyzer takes sample of each input signal from comparator whenever clock signal is applied to memory and to stores into memory.</p> <p>The clock input may be from :</p> <p>Internal asynchronous clock input: It produced by internal oscillator, which is very stable in operation.</p> <p>External clock input: It is clock from any external source. It takes around 256 to 1024 samples of each signal and stores them in memory.</p> <p>When trigger is applied to memory, memory displays these stored samples.</p> <p>The trigger input may be from Word comparator or External trigger input.</p> <p>The word comparator generates trigger when it's two input one from adjustable threshold comparator and another from word selection switch.</p> <p>If both inputs code are same then it send trigger to memory.</p> <p>After applying trigger to memory, then it send to display scan circuit.</p> <p>The display scan circuit then constructs the original waveform and displays it on the CRT.</p>	
	<p><b>e)</b> <b>Ans</b></p>	<p><b>Which different testing are performed by diagnostic software?</b></p> <p>The PC has a sophisticated hardware fault which is not detected by POST. There are problem in the system but it is not known whether it is hardware or software problem.</p> <p><b>1. Sophisticated hardware faults</b></p> <p>Diagnostic software can test and detect problems on all motherboard components, drives, ports, and slots. Diagnostic software perform</p>	<p><b>4M</b></p> <p><i>Explanation</i> <b>4M</b></p>



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		<ul style="list-style-type: none"><li>• CPU testing</li><li>• Hard drives testing</li><li>• SSDs testing</li><li>• RAM testing</li><li>• Optical drives (CD, DVD and Blu-ray) testing</li><li>• Sound cards testing</li><li>• Graphics cards testing (GPGPU, Video RAM, 2D graphics, 3D Graphics and video playback)</li><li>• Network ports testing</li><li>• Printers testing</li><li>• Microphones testing</li><li>• Webcams testing</li><li>• Battery's testing</li><li>• Tape drives testing</li><li>• USB ports (USB 3.0 and 2.0) testing</li><li>• Serial ports and Parallel ports testing</li></ul> <p><b>2. Hardware – Software problem isolation</b> Certain problem caused by errors in the system software or application program may appear to be hardware or software faults. In such cases If the diagnostic program run successfully, it will isolate the problem easily i.e. hardware or software problem.</p> <p><b>3. Intermittent hardware fault</b> If there is any intermittent hardware fault in the PC, it may not be caught by POST, even diagnostic program may run successfully once or twice. But when you repeatedly and continuously run the diagnostic program for long time then intermittent hardware fault will be caught.</p>	
	<b>f)</b> <b>Ans</b>	<p><b>Explain any four applications of BGA work station.</b> <b>Applications of BGA workstation:</b> 1. BGA is used to repair Laptops, Mobiles, Server Boards and Desktop boards. 2. It is used to remove any IC from Motherboard without damaging</p>	<b>4M</b>

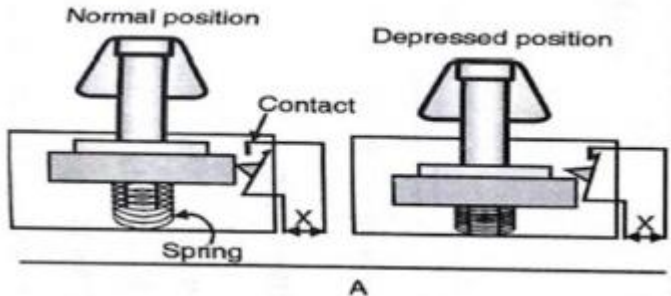


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		<p>any other components.</p> <p>3. It is used to replace the faulty north bridge IC or South Bridge IC or Reballing of the IC's.</p> <p>4. It is used for upgrading of Motherboard functionality.</p>	<p><i>Each Application 1M</i></p>
4	<p>a)</p> <p><b>Ans</b></p>	<p><b>Attempt any <u>FOUR</u> of the following</b></p> <p><b>Write the working principle of mechanical key switch with neat diagram.</b></p> <p>Mechanical Key Switch</p> <p>Mechanical parts are used in mechanical key switch; Two Metal pieces or contacts are used and are kept in open position and moved into close position when the switch is depressed.</p> <p>When key is not pressed (normal position) contact is in open position, when key depressed contact is in closed position, this contact sense by keyboard interface at the location 'X'.</p> <p>To improve lifespan of switch gold plating done on this contact.</p> <p>Life of switch is around 1 million keystroke</p> <div style="text-align: center;">  </div>	<p><b>16 4M</b></p> <p><i>Explanation 2M</i></p> <p><b>Diagram 2M</b></p>
	b)	<p><b>Draw block diagram of internal modem and state the function of various blocks.</b></p>	<p><b>4M</b></p>



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Ans

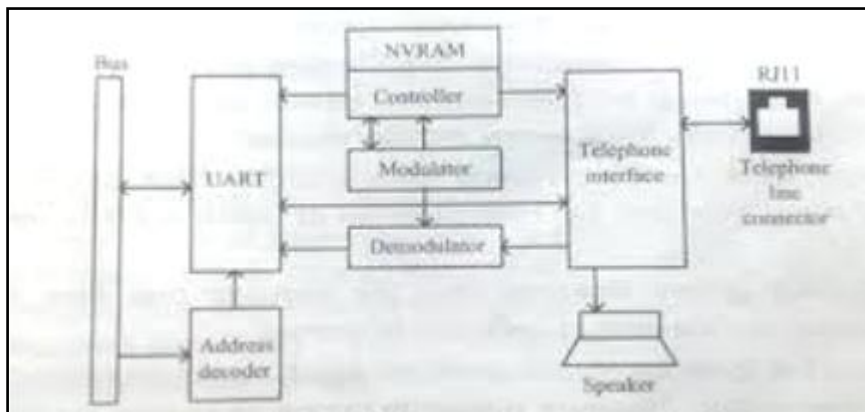


Diagram  
2M

- The internal modem contains its own universal asynchronous receiver/transmitter (UART). The UART work here logically as serial port.
- A modulator circuit converts the serial digital data from the computer into analog signals to be transmitted over telephone line. The analog signal is then coupled to the telephone line using a circuit very similar to that used by ordinary telephone to couple voice signals. Then this analog signal passes to the telephone line through telephone jack (RJ-11 connector socket)
- On the receiver side, serial signals received from telephone line. The telephone interface separate received signals and passes them to demodulator. The demodulator converts analog signals into digital form and send this serial data to UART. The UART convert serial bit data into parallel byte and placed on the system's data bus.
- Besides combining and separating modulated audio data, the telephone interface generates the Dual-Tone-Multi-Frequency (DTMF) dialing signals needed to reach a remote modem. When a remote modem dials in the telephone interface defects the incoming signals and alerts the UART to begin negotiating a connection.
- Finally the telephone interface drives a small speaker during

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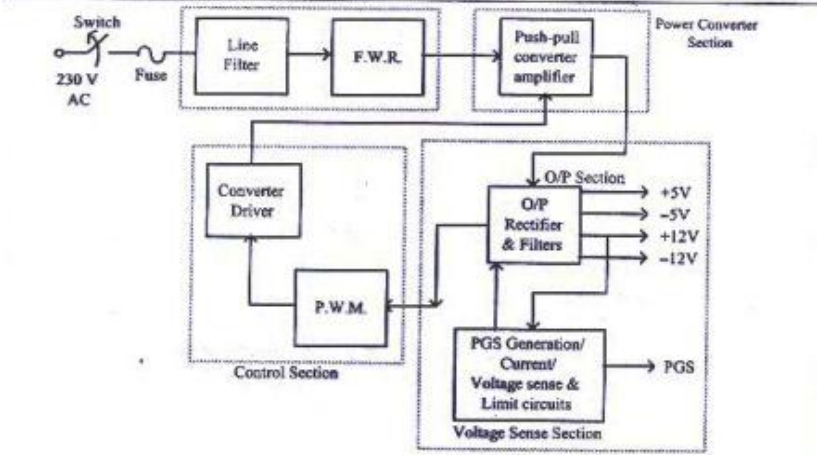


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		<p>find stages of modem operation.</p> <ul style="list-style-type: none"> <li>The speaker is used to hear a dial tone, dialing signals and audio negotiation between the two modems. Once a connection is established, the speaker is usually disabled. A controller circuit manages the overall operation of the modem. Generally it is used to manage modem between in control and data operating modes The NVRAM (Non Volatile RAM) it is used to store modem parameters.</li> </ul>	
	<p><b>c)</b> <b>Ans</b></p>	<p><b>Give the signal voltages for following colors of ATX connectors:</b> <b>Red, Black, Orange and Purple.</b> RED :- +5V BLACK:- GND (Ground) ORANGE:- +3.3V PURPLE:-+5VSB(Standby)</p>	<p><b>4M</b>  <i>Each correct signal voltage 1M</i></p>
	<p><b>d)</b> <b>Ans</b></p>	<p><b>With neat block diagram explain working of Smmps.</b></p>  <p>SMPS in a PC has five sections: AC input section Receives unregulated input AC supply from mains. This signal is filtered using line filter and given to full wave rectifier for rectification. The fuse protects the SMPS from over current draining. Power converter It consists of push pull configuration of transistors</p>	<p><b>4M</b>  <i>Diagram 2M</i>  <i>Explanation 2M</i></p>



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		<p>which are driven by converter driver from the control section. Only desired quantity of power is delivered to the load.</p> <p>Control section It senses over voltage or over current at load. It changes the turn on time of the transistors in the push pull amplifier so that output power can be controlled. It applies Pulse Width Modulated Waveforms to converter driver circuit at 22 KHz frequency.</p> <p>Output section It rectifies and filters the power received from the power section It provides short circuit and overload protection to the power applied to the load.</p> <p>Voltage sense section It generates Power Good Signal (PGS). When all four voltage outputs (+5V, -5V, +12V, -12V) are steady above minimum sense levels for more than 100ms, PGS is generated by this section. It checks the maximum load current and compares it with specified current. If the connected load exceeds the specified load, current limit circuits shut off the output section of the SMPS, thereby avoiding damage due to over current flow.</p>	
	<p>e)</p> <p><b>Ans</b></p>	<p><b>Draw the block diagram of RS232 connector and give the function of each signal.</b></p> <p>1. CD (Carrier Detect or Data Carrier Detect): It is used by computer to know that the modem connected to the serial port has made proper connection with modem on the other side.</p> <p>2. Rx/D (Receive Data): It is used by the device connected to the serial port to send data to the computer Or data send from DCE to</p>	<p><b>4M</b></p> <p><i>Diagram 2M</i></p>



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		<p>DTE</p> <p>3. TxD (Transmit Data): It is used by the computer to send data to a device connected to the serial port Or Data sent from DTE to DCE</p> <p>4. DTR (Data Terminal Ready): It is send from computer to the device connected to the serial port to inform that computer is ready for communication</p> <p>5. GND (Signal Ground): This is one of the most important signal. This wire provides the necessary return path for both the data signals and the hand shaking signals.</p> <p>6. DSR (Data Set Ready): It is send from the device connected to the serial port to the computer to inform that the device is ready for communication</p> <p>7. RTS (Request To Send): One clear to send signal is received the computer send Request To Send (RTS) signal to the device connected to the serial port to inform that computer is also ready to start the data transmission</p> <p>8. CTS (Clear To send): Clear to send or CTS signal is used by the device connected to the serial port to inform to the computer can start the data transmission.</p> <p>9. RI (Ring Indicator): RI Signal is used by the device connected to the serial port to inform to the computer that it has detected a ringing voltage on the telephone line. This signal is used by a modem connected to the serial port to inform to the computer that someone is calling the modem</p>	<p><i>Explanation</i> <b>2M</b></p>
	<p><b>f)</b> <b>Ans</b></p>	<p><b>Draw the diagram of centronics interface and explain function of any four signals.</b></p>	<p><b>4M</b></p>

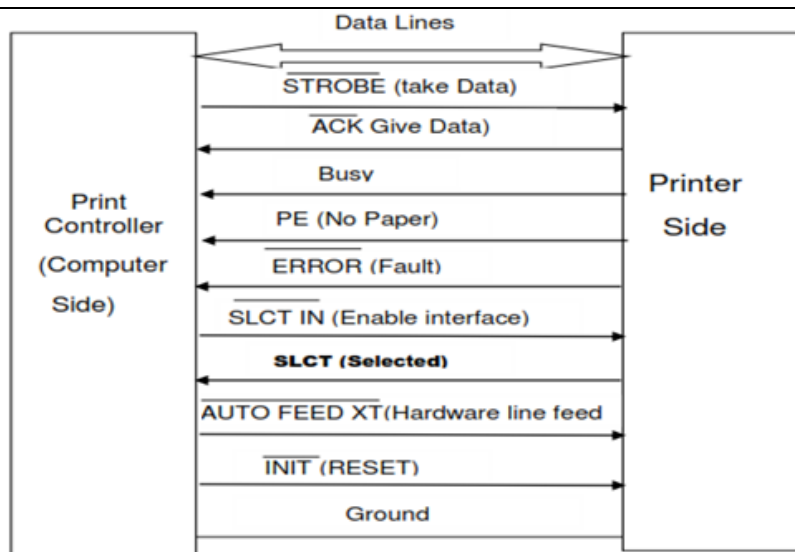


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**Signals in Centronics interface**

**Diagram**  
**2M**

**Centronic interface signals:**

The Centronic Interface is a handshake protocol between a computer and a printer. It supports maximum data transfer speed of 100Kb/s. There are 8 signals lines for data bits. The control signals used are:

STROBE: The printer should take data when this signal is low.

INIT: When it is low the printer resets the electronics logic and clears the printer buffer.

SLCTIN: It is an interface unable signal. When it is low the printer responds to the signals from the controller.

AUTOFEEDXT: After printer every line, the printer will provide one line feed automatically if this signal is low. This type of line feed is known as hardware line feed. There are five status signals from printer to PC.

ACK: It is an acknowledgement for strobe signal from the PC. When active it indicates that printer has received data sent by the PC and the printer is ready to receive the next data byte.

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		<p>PE (Paper End): When PE is high it indicates that there is no paper in the printer. Either the paper is torn or the paper is over.</p> <p>SLCT: It indicates that the printer is selected and logically connected to the PC.</p> <p>BUSY: When the busy signal is high, it indicates that the printer is busy and it cannot receive data</p> <p>ERROR: It indicates that there is some error condition in the printer.</p>	
5	<p>a) <b>Ans</b></p>	<p><b>Attempt any <u>TWO</u> of the following</b></p> <p><b>Describe real and protected mode of processor in detail</b></p> <p>Processor Modes: Processor modes refer to the various operating environment that affect the instructions and capabilities of the chip. The processor mode controls how the processor sees and manages the system memory and the tasks that use it.</p> <p><b><u>Real Mode:</u></b></p> <ul style="list-style-type: none"> <li>• The 16 bit instruction mode of 8088 is called the real mode.</li> <li>• These 16 bit operating systems and applications are designed to run on original 8088 processor.</li> <li>• It has 20-bitsegmented memory.</li> <li>• In this mode, direct access to BIOS routines &amp; peripherals are available.</li> <li>• There is no memory protection and no multitasking at hardware level.</li> <li>• Only one program can run at a time.</li> <li>• No built in protection exists to keep one program from overwriting another program or even the operating system in the memory.</li> <li>• This mode is also called as compatibility mode.</li> </ul> <p><b><u>Protected Mode:</u></b></p> <ul style="list-style-type: none"> <li>• It was introduced with 386 processor which was the first 32 bit processor and it could run entirely on 32 bit instruction set.</li> <li>• This new 32 bit mode was called protected mode because software programs running in this mode are protected from being overwritten in the memory.</li> <li>• Such protection makes the system more crash proof. There is no 1</li> </ul>	<p><b>16 8M</b></p> <p><i>Relevant feature / explanat ion of each mode 4M</i></p>



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		<p>MB limit in protected mode.</p> <ul style="list-style-type: none"> <li>• This mode has ability to multitask, meaning having the operating system manage the execution of multiple programs simultaneously.</li> <li>• It supports virtual memory, which allows the system to use the hard disk to emulate additional system memory when needed.</li> <li>• It has backward compatibility.</li> <li>• 32 bit physical and virtual address space was used in 80386.</li> </ul>	
	<p><b>b)</b> <b>Ans</b></p>	<p><b>Draw the block diagram of North bridge and South bridge architecture and describe the various blocks</b> <b>North bridge-South bridge Architecture:</b> Intel's earlier chipset were broken into multi-tiered architecture known as North Bridge and South Bridge components as well as Super I/O chip.</p> <p><b>North Bridge:</b> It is the connection between the high speed processor bus and the slower AGP &amp; PCI buses. Northbridge is also referred to as PAC (PCI-AGP) controller is the main component of the motherboard and only motherboard circuit (besides the processor) that runs at the full motherboard speed. It serves as the four way connection between CPU, Memory, Video card and south bridge. It handles communication between CPU, RAM, AGP or PCI Express and the Southbridge.</p> <p><b>South Bridge:</b> It is the bridge between PCI bus and even slower ISA bus. It is the lower speed component of the chipset. It is connected to On-board graphics controller. The south bridge connects to the 33MHz PC and contains the interface to ISA bus. It also contains dual ATA/IDE hard disk controller interfaces, one or more USB interfaces, CMOS RAM, Flash ROM, real time clock functions, interrupt controller, DMA controller.</p> <p><b>Super I/O chip:</b> contains commonly used peripheral items all combined in a single chip.</p>	<p><b>8M</b></p> <p><i>Descript ion 4M</i></p>

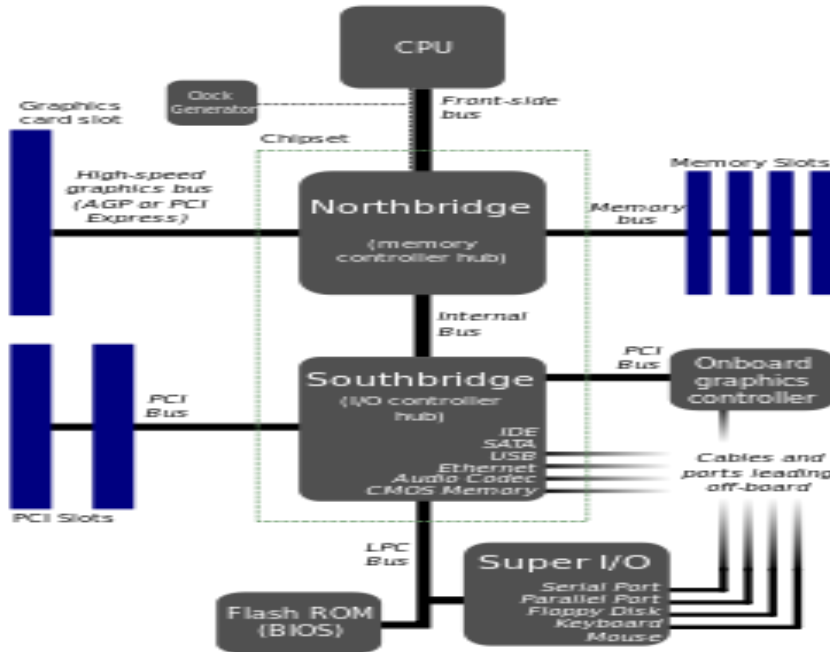
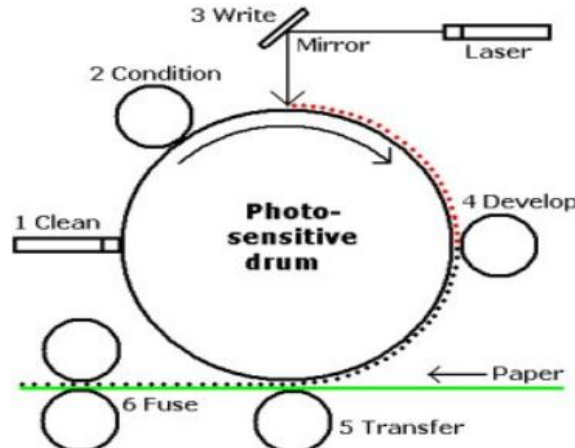


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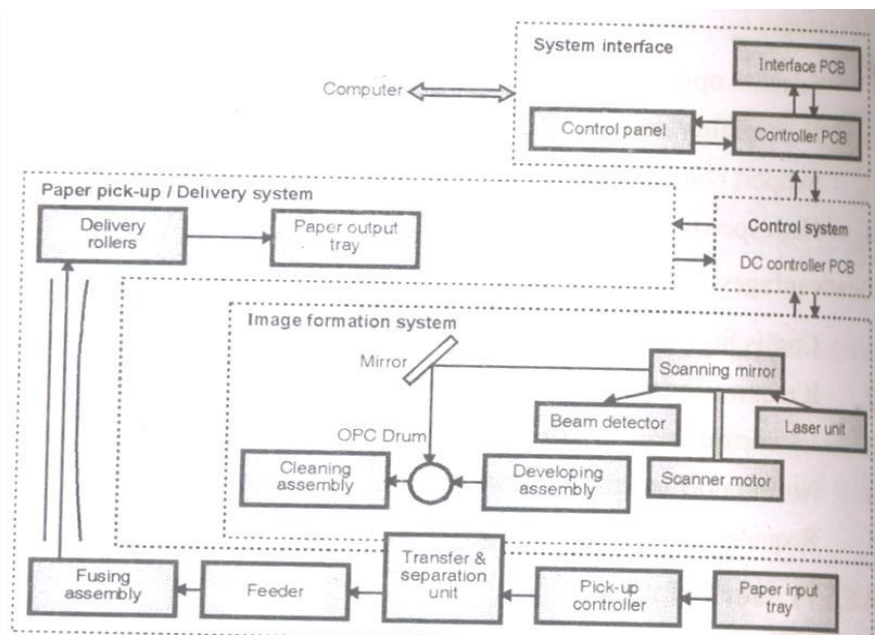
		 <p>The diagram illustrates the architecture of a computer system. At the top is the CPU, connected to a Front-side bus. Below the CPU is the Chipset, which contains the Northbridge (memory controller hub) and the Southbridge (I/O controller hub). The Northbridge is connected to the Front-side bus, a High-speed graphics bus (AGP or PCI Express) leading to a Graphics card slot, and a Memory bus leading to Memory Slots. The Southbridge is connected to the Northbridge via an Internal Bus. It manages PCI Slots, an Onboard graphics controller, IDE, SATA, USB, Ethernet, Audio Codec, and CMOS Memory. It also connects to a Super I/O chip (Serial Port, Parallel Port, Floppy Disk, Keyboard, Mouse) and a Flash ROM (BIOS) via an LPC Bus. Cables and ports leading off-board are also shown.</p>	<p style="text-align: right;"><i>Block Diagram</i> <b>4M</b></p>
c)	<p>Describe different stages of the process of printing a document on laser printer with suitable diagram. <i>Note: Any other relevant diagram shall be considered</i></p> <p><b>Ans</b> Laser Printer Printing Process:</p>  <p>The diagram shows the six stages of the laser printing process around a central Photo-sensitive drum. 1. Clean: A wiper cleans the drum. 2. Condition: A corona wire charges the drum. 3. Write: A laser beam, reflected by a mirror, writes the image onto the drum. 4. Develop: Toner is applied to the drum. 5. Transfer: Toner is transferred to the paper. 6. Fuse: The toner is fused onto the paper. The final output is labeled 'Laser Printing Process'.</p> <p style="text-align: center;"><b>OR</b></p>	<p style="text-align: right;"><b>8M</b></p> <p style="text-align: right;"><i>Diagram</i> <b>4M</b></p>	



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**Image Formation system**

Image formation process revolves around a photo sensitive drum, called organic Photo conductive (OPC) drum. This drum is located inside the Electro photographic cartridge inside the laser printer.

Image formation process consists of following six steps

1. Cleaning of the OPC drum.
2. Conditioning of the OPC drum.
3. Electro-statically writing the image onto the OPC drum
4. Developing the image on the OPC drum.
5. Transferring of the image from OPC drum to the paper.
6. Fusing the image on the paper.

**1.Cleaning of the OPC drum**

Before transferring any image to the OPC drums surface, the surface needs to be cleaned and prepared to hold the image being transferred. The drums surface is cleaned physically to remove any trace of the old toner particles from the previous printing operation and is cleaned electro statically to remove any charge present on the drums surface from the last printing.

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	<p><b>2. Conditioning of the OPC drum</b> In this process, a uniform charge of -600V is applied to the complete surface of the OPC drum.</p> <p><b>3. Writing the image on the OPC drum</b> After the conditioning process its surface has a uniform - 600V potential. To write any information on this drum laser beam is focused on the selected areas of the drum. The area where laser strikes discharges to ground and the area where laser does not strike remains at -600V. Later this beam is focused and sent to the scanning mirror, the scanning mirror sweeps the beam across the entire width of the OPC drum. Once one dot line of image is drawn on the OPC drum, the drum is rotated by 1/300th of an inch, so that the beam can write the next line.</p> <p><b>4. Developing the image on the OPC drum</b> When the image is completely written onto the drum, the latent image is ready. To transfer the latent image into a visible image the toner is transferred to the discharged areas of the drum. The toner is a black plastic resin, powdery substance bound to iron particles. It is also available in colors other than black. The developer section consists of a rotating metallic cylinder, a permanent magnet inside the cylinder, a toner cavity and a toner height control blade. The iron in the toner causes it to be attracted to the magnet inside the developing cylinder. As the cylinder rotates, the height control blade limits the amount of toner on the cylinder to a uniform thickness. The developing cylinder is connected to a negative power supply. Hence the toner particles receive a negative charge from the cylinder. This negative electrostatic charge causes the toner to be attracted to the areas of the OPC drum which has been exposed to the laser beam or those areas that contain the image to be printed.</p> <p><b>5. Transfer of the image to paper</b> Once the image is developed on the OPC drum, using the corona wire positive charge is given to the paper. The positive charge applied to the paper is stronger than the charge on the OPC drum. This pulls the negatively charged toner particles away from the drum to the paper. As the paper and the drum move, the stiffness and the small radius of the drum makes the paper move away from the OPC drum. This process of paper separation is assisted by a static charge eliminator which weakens the attractive force between the drum and the paper.</p>	
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		<p><b>6.Fusing the image to the paper</b> It consists of a non stick roller, covered with Teflon type coating. The roller is heated from inside using very high intensity quartz lamp. The heated roller melts the toner and fuses it on the printing media.</p>	
6	<p><b>a)</b> <b>Ans</b></p>	<p><b>Attempt any <u>TWO</u> of the following</b> <b>Explain construction and recording of DVD with diagram.</b> A DVD is composed of several layers of plastic, totaling about 1.2 millimeters thick. Each layer is created by injection molding polycarbonate plastic. This process forms a disc that has microscopic Lands/Pits arranged as a single, continuous and extremely long spiral track of data. Once the clear pieces of polycarbonate are formed, a thin reflective layer is sputtered onto the disc, covering the bumps. Aluminum is used behind the inner layers, but a semi-reflective gold layer is used for the outer layers, allowing the laser to focus through the outer and onto the inner layers. After all of the layers are made, each one is coated with lacquer, squeezed together and cured under infrared light.</p> <div data-bbox="388 1136 1183 1421" data-label="Image"> </div> <p><b>Recording:</b> During recording, a powerful laser beam is focused on the organic dye recording material, and the heat from the laser changes the chemical structure of the dye. During playback, the playback laser can sense which parts of the dye have been changed by heat and which haven't. Through this process the [0] and [1] of a digital signal can be represented. However, changes in the dye structure are permanent, so the disc cannot be rewritten. The recording material used is in crystalline form before recording. When it is heated by the powerful laser, it becomes amorphous and loses its crystalline structure. However, weaker laser light can be used to slowly heat it to return it to its original crystalline form. In this</p>	<p><b>16</b> <b>8M</b></p> <p><i>Explanation 2M</i></p> <p><i>Construction Diagram 2M</i></p> <p><i>Recording Explanation 2M</i></p>

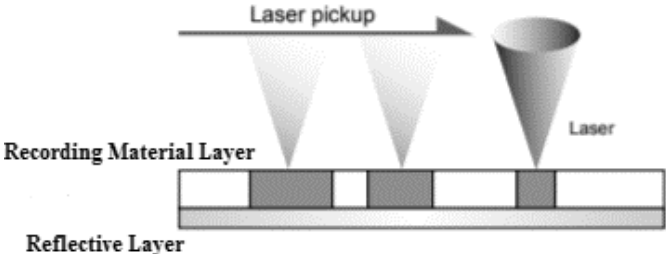


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		<p>way, the disc can be rewritten over and over.</p>  <p>The diagram illustrates the structure of a compact disc. It shows a cross-section of the disc with two main layers: a top 'Recording Material Layer' and a bottom 'Reflective Layer'. A 'Laser pickup' head is shown above the disc, emitting a cone of light onto the recording layer. A 'Laser' source is also indicated, pointing towards the recording layer.</p>	<p><b>Diagram</b> <b>2M</b></p>
	<p><b>b)</b> <b>Ans</b></p>	<p><b>What is FAT? Explain different type of FAT.</b> <b><u>File Allocation Table (FAT)</u></b></p> <ul style="list-style-type: none"> <li>FAT refers to a data table that holds information about how and where files are stored in any partition</li> <li>It is a kind of index used by operating system to keep track of information stored on the hard disk</li> <li>FAT keeps a map of the complete surface of the disk drive( which area is free, which area is bad etc.)</li> <li>The FAT stores information about clusters on the disk in a table There are different types of FAT which vary based on their size</li> <li>Each cluster has one entry on the FAT. They are used to hold the cluster number, Size of FAT decides the number of clusters on a disk volume</li> </ul> <p><b><u>FAT 16</u></b></p> <ul style="list-style-type: none"> <li>FAT 16 uses a 16 bit binary number to hold a cluster. A volume using FAT 16 can hold a maximum of 65524 clusters</li> <li>FAT 16 is used in HD volumes ranging from 16 MB to 2048 MB( 2GB)</li> <li>Cluster size is 2 KB – 32 KB.</li> <li>It is compatible with a wide variety of operating systems ( Windows, LINUX and some versions of UNIX ).</li> <li>FAT 16 is efficient in speed and storage on volumes smaller than 256 MBs</li> <li>It has fixed maximum number of clusters per partition. As HD gets bigger and bigger the size of each cluster becomes larger.</li> </ul>	<p><b>8M</b></p> <p><b>About</b> <b>FAT</b> <b>2M</b></p> <p><b>Descript</b> <b>ion of</b> <b>Types</b> <b>3M each</b></p>



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		<ul style="list-style-type: none"> <li>FAT 16 is limited to 65524 clusters.</li> <li>It is inefficient on larger volume sizes.</li> <li>Does not have any file level security.</li> </ul> <p><b><u>FAT 32</u></b></p> <ul style="list-style-type: none"> <li>It supports drives upto 2 TB.</li> <li>Since it can space more efficiently, it uses smaller clusters(4 KB clusters for drives upto 8 GB).</li> <li>It has better allocation of disk space.</li> <li>The number of entries in the root folder does not have any restriction as in FAT 16.</li> <li>More robust. It can relocate the root directory and use the back up copy of the FAT instead of the default copy.</li> <li>FAT 32 Are not susceptible to single point of failure than FAT 16</li> <li>These are not accessible for OS other than the ones from Microsoft.</li> <li>Partition sizes are limited to 32 GB.</li> <li>No native file level security.</li> <li>No compression or encryption available on FAT 32 file system.</li> </ul>	
	<p>c)</p> <p><b>Ans</b></p>	<p><b>Explain following protection device.</b></p> <p><b>(i) Circuit breaker</b></p> <p><b>(ii) Surge- suppressor.</b></p> <p><b>Circuit Breaker:</b></p> <p>A <b>circuit breaker</b> is an automatically operated electrical switch designed to protect an electric circuit from damage caused by overload or short circuit. Its basic function is to detect a fault condition and, by interrupting continuity, to immediately discontinue electrical flow. Unlike a fuse, which operates once and then must be replaced, a circuit breaker can be reset (either manually or automatically) to resume normal operation. Circuit breakers are made in varying sizes, from small devices that protect an individual household appliance up to large switchgear designed to protect high voltage circuits feeding an entire city.</p> <p><b>Working:</b> The basic circuit breaker consists of a simple switch, connected to either a bimetallic strip or an electromagnet. The hot wire in the circuit connects to the two ends of the switch. When the</p>	<p><b>8M</b></p> <p><i>Each explanat ion 4M</i></p>





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	<p>switch is flipped to the on position, electricity can flow from the bottom terminal, through the electromagnet, up to the moving contact, across to the stationary contact and out to the upper terminal. The electricity magnetizes the electromagnet. Increasing current boosts the electromagnet's magnetic force, and decreasing current lowers the magnetism. When the current jumps to unsafe levels, the electromagnet is strong enough to pull down a metal lever connected to the switch linkage. The entire linkage shifts, tilting the moving contact away from the stationary contact to break the circuit. The electricity shuts off.</p> <p><b>Surge Suppressor:</b> These circuits are designed to absorb high voltage transients produced by lightning and other high energy equipment. Protection is accomplished by clamping voltages above a certain level. Metal oxide varistors are often included that respond quickly and clamp the voltage. The Metal oxide varistor is a disc shaped electronic component made from a layer of zinc oxide particles held between two electrodes. The granular zinc oxide offers a high resistance to electricity until the voltage reaches a break over point. The electrical current then forms a low resistance path between the zinc oxide particles. The Metal oxide varistors are designed to accept voltages as high as 6000V and divert any power above 250V to ground. Metal oxide varistors degrade with each spike. Once they have passed a number of surges they must be replaced by new a one. Many suppressers show an LED when the Metal oxide varistor has blown.</p>	
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