



MODEL ANSWER

WINTER - 2017 EXAMINATION

Subject: Computer Hardware & Networking

Subject Code: 17533

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>Attempt any <u>THREE</u> of the following: Explain architecture of Intel chip set 945G with diagram.</p> | <p>12 4M</p> <p style="font-size: 1.2em;"><i>Diagram 2M</i></p> |



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| | | |
|-------------------------|---|---|
| | <ul style="list-style-type: none">• The Intel 945G chipset family includes 3 members 945G, 945P and 945TL.• It supports Intel new dual core Pentium. Processor & also supports Pentium 4HT technology processor.• It offers FSB speed up to 1066 MHz• 4GB dual channel DDR2 memory.• It also incorporates Intel graphic media accelerator integrated on board.• It uses ICH7 which is faster than ICH6. | <p><i>Explanation any 4 points: 2M</i></p> |
| <p>(ii)</p> <p>Ans.</p> | <p>With the help of diagram explain the working of:</p> <p>1) On-line UPS 2) Off-line UPS</p> <p>1) On-line UPS: In on-line UPS the power for the system is supplied from the batteries i.e. the battery charges continuously then the battery provides DC voltage to inverter. Here inverter converts DC to 230 V, 50Hz AC voltage and is applied to the computer. In this type of UPS the switching is not involved so spikes are not generated. This UPS is useful in isolating AC mains from system.</p> <div data-bbox="423 1268 1252 1476" data-label="Diagram"><pre>graph LR; A["230 V 50 Hz AC"] --> B["Rectifier AC to DC"]; B --> C["Battery DC"]; C --> D["Inverter DC to AC"]; D --> E["230 V, 50 Hz AC"]</pre></div> | <p>4M</p> <p><i>On-line UPS Diagram 1M & Explanation 1M</i></p> |

OR

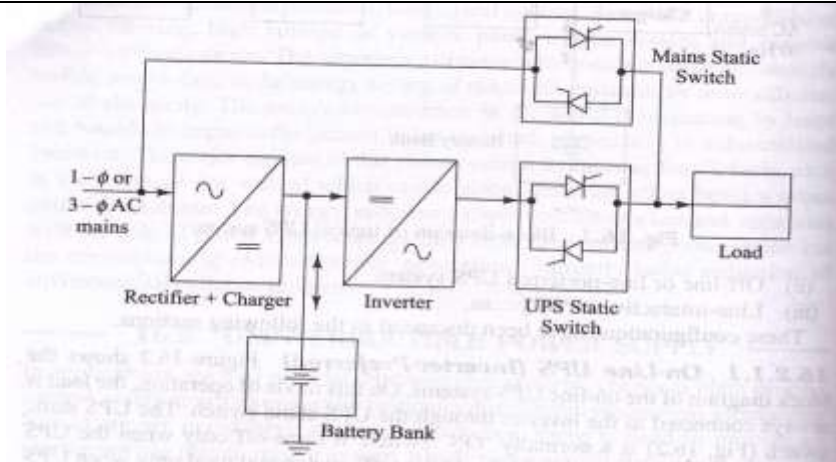


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Explanation:

- In ON line UPS the rectifier is used to convert A.C. supply to DC supply which supplies power to the inverter as well as the battery bank to keep it charged.
- Inverter is used to convert DC to AC supply.
- In this, UPS Static Switch is normally ON.
- Mains static switch is Normally OFF and used only when UPS is to be bypassed.
- When UPS fails the UPS Static switch which is normally ON is made OFF and Mains static switch is made ON to connect AC supply directly to load.

2) Off-line UPS:

It is also called as SPS (Standard power supply). In this type of UPS the battery is charged when the AC mains are on and as soon AC mains are off, the battery discharges and supplies power to the PC. Thus the high switching is involved in off-line UPS and power will be available till the battery discharges. It is useful when there is good power supply.

*Off-line
UPS
Diagram
1M &
Explan
ation 1M*

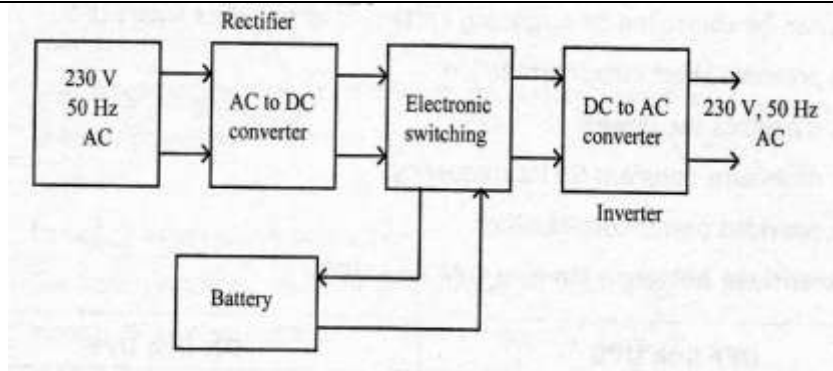


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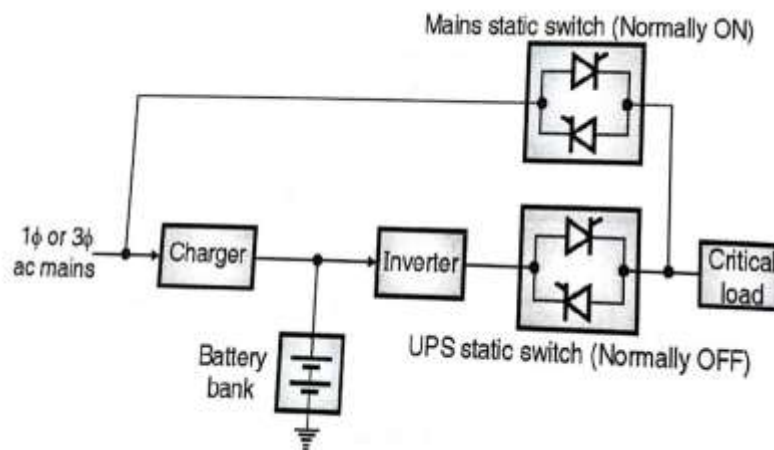
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Or



Explanation:

In this, UPS static switch is normally OFF.

- Mains static switch is Normally ON and supplies power to the load.
- When mains fail, the UPS static switch which is normally OFF is made ON and directly connected to the load.
- A static switch will connect or disconnect the battery from the input of the inverter depending on the status of ac mains.

(iii) Explain the preventive maintenance of:

- 1) Mouse
- 2) CD ROM drive

Ans.

4M



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| | | |
|--------------|--|--|
| | <p>1) Mouse:</p> <p>A .Optical:</p> <ol style="list-style-type: none">1. Ensure that nothing comes into contact with the optical sensor.2. To clean an optical mouse, disconnect it from the computer and simply wipe over the outside of the mouse, using a cloth dampened with isopropyl alcohol. The mouse can then be reconnected to the computer. <p>B. Opto-mechanical:</p> <ol style="list-style-type: none">1. A mouse ball will pick up dust from any surface it rolls over2. Keep the area where the mouse is used clean, dry and free of dust3. If the mouse is used with a mouse pad, keep the surface of the mouse pad clean. Occasionally wiping your mouse pad with a damp cloth will remove any build up of dust. To inspect the mouse for dirt or damage, remove the mouse from the computer and remove the ball-access slide cover.4. Check the ball for any signs of damage, such as pits, cracks or grooves, or distortion in the shape of the mouse ball.5. If none, inspect the rollers inside the mouse for any sign of debris.6. To clean the rollers, use a cotton swab or carefully use a small, flat-bladed screwdriver to scrape off the build-up.7. Use a damp, lint-free cloth to clean the mouse ball. Make sure the ball is completely dry before reinserting it, and replacing the cover. <p>2) CD ROM drive:</p> <ol style="list-style-type: none">1. Cleaning of the head: use head cleaning diskettes for purposes.2. Disk drive heads can also be manually cleaned using alcohol and foam swab rapped in a lint free material with immense care.3. Carry out disk speed test and adjustments by test programs.4. Disk drive alignment and tracking adjustment should be checked every year.5. Use a canned gas duster to dust off the interior of the drive.6. Use the silicon lubricant ion whatever items that need lubrication | <p><i>Mouse: Any 4 points 2M</i></p> <p><i>CD ROM drive: Any 4 points 2M</i></p> |
| (iv) Ans. | <p>Draw the 20 Pin ATX power connection with color code and describe the signals.</p> | 4M |



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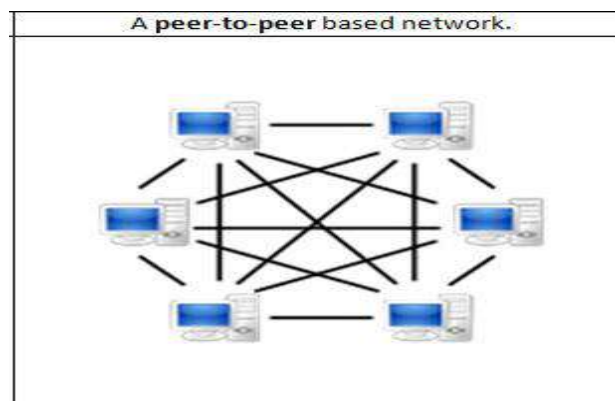
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In P2P networks overall network performance actually improves as an increasing number of peers are added to the network.

These peers can organize themselves into ad-hoc groups as they communicate, collaborate and share bandwidth with each other to complete the tasks at hand (e.g. file sharing).

Each peer can upload and download at the same time, and in a process like this, new peers can join the group while old peers leave at any time.

This dynamic re-organization of group peer members is transparent to end-users.



Client Server Network:

There are an almost infinite variety of client/server networks, but all of them have a couple of things in common.

All have centralized security databases that control access to shared resources on servers.

A client can only send requests to a server and then wait for the server's response.

The server contains a list of usernames and passwords. Users can't log on to the network unless they supply valid usernames and passwords to the server.

Once logged on, users may access only those resources that the network administrator allows them to access.

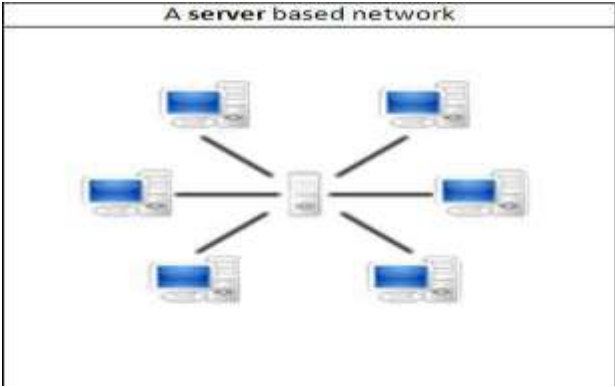


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| | | <p>Thus, client/server networks possess much more security than do peer-to-peer networks. Client/server networks also tend to be much more stable.</p> <div style="text-align: center;">  <p style="text-align: center;">A server based network</p> </div> | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|------------------|--|--|--------|-----------|-----------|---|-----------------|-----------------|---|----------------------------------|-------------------------------|---|--|---|---|---|--|---|--|---------------------------------------|---|-------------------------------------|---------------------------------------|---|---|--|---|---|--|---|
| (ii) Ans. | <p>Compare between OSI and TCP/IP reference model. (any 6 Points).</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;">Sr. No</th> <th style="width: 40%;">OSI Model</th> <th style="width: 50%;">TCP Model</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>It has 7 layers</td> <td>It has 4 layers</td> </tr> <tr> <td>2</td> <td>It is postdate to TCP/IP (1983).</td> <td>It is predated to OSI (1970).</td> </tr> <tr> <td>3</td> <td>Session & presentation layers are present.</td> <td>Session layer & presentation layers are absent.</td> </tr> <tr> <td>4</td> <td>Models were derived first. Doesn't state the protocols to be use.</td> <td>Protocol came first it model describe the existing protocol.</td> </tr> <tr> <td>5</td> <td>Not particularly use to compare other model.</td> <td>Particularly use in maximum networks.</td> </tr> <tr> <td>6</td> <td>Can be used to compose other model.</td> <td>Can't be used to compose every model.</td> </tr> <tr> <td>7</td> <td>N/W layer is both connection oriented & connectionless.</td> <td>Network/Internet layer is connection less.</td> </tr> <tr> <td>8</td> <td>Transport layer is connection oriented.</td> <td>Transport layer is both connection less & connection oriented.</td> </tr> </tbody> </table> | | Sr. No | OSI Model | TCP Model | 1 | It has 7 layers | It has 4 layers | 2 | It is postdate to TCP/IP (1983). | It is predated to OSI (1970). | 3 | Session & presentation layers are present. | Session layer & presentation layers are absent. | 4 | Models were derived first. Doesn't state the protocols to be use. | Protocol came first it model describe the existing protocol. | 5 | Not particularly use to compare other model. | Particularly use in maximum networks. | 6 | Can be used to compose other model. | Can't be used to compose every model. | 7 | N/W layer is both connection oriented & connectionless. | Network/Internet layer is connection less. | 8 | Transport layer is connection oriented. | Transport layer is both connection less & connection oriented. | <p>6M</p> <p><i>Any six points 1M each</i></p> |
| Sr. No | OSI Model | TCP Model | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | It has 7 layers | It has 4 layers | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | It is postdate to TCP/IP (1983). | It is predated to OSI (1970). | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Session & presentation layers are present. | Session layer & presentation layers are absent. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Models were derived first. Doesn't state the protocols to be use. | Protocol came first it model describe the existing protocol. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | Not particularly use to compare other model. | Particularly use in maximum networks. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | Can be used to compose other model. | Can't be used to compose every model. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | N/W layer is both connection oriented & connectionless. | Network/Internet layer is connection less. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | Transport layer is connection oriented. | Transport layer is both connection less & connection oriented. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |



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| 2. | a) Ans. | <p>Attempt any <u>FOUR</u> of the following: Explain BIOS with its any three functions.</p> <p>The BIOS (Basic Input Output System) provides the processor with the information required to boot the system from a non-volatile storage unit (HDD, FDD, CD or other). It provides the system with the settings and resources that are available on the system.</p> <p>Main functions of BIOS:</p> <ol style="list-style-type: none">1. The main function of the BIOS is to give instructions for the power-on-self-test (POST). This self-test ensures that the computer has all of the necessary parts and functionality needed to successfully start itself, such as use of memory, a keyboard and other parts.2. If errors are detected during the test, the BIOS instruct the computer to give a code that reveals the problem. Error codes are typically a series of beeps heard shortly after startup.3. The BIOS also works to give the computer basic information about how to interact with some critical components such as drives and memory that it will need to load the operating system.4. Once the basic instructions have been loaded and the self-test has been passed, the computer can proceed with loading the operating system from one of the attached drives.5. Computer users can often make certain adjustments to the BIOS through a configuration screen on the computer. The setup screen is typically accessed with a special key sequence during the first moments of the startup. This setup screen often allows users to change the order in which drives are accessed during startup and control the functionality of a number of critical devices. Features vary among individual BIOS versions.6. Many PC manufacturers today use flash memory cards to hold BIOS information. This allows users to update the BIOS version on computers after a vendor releases an update. This system was designed to solve problems with the original BIOS or to add new functionality. Users can periodically check for updated BIOS versions, as some vendors release a dozen or more updates over the course of a products lifetime. To check for updated BIOS, users can check the website of the specific hardware vendor | 16 4M <i>1M for Explan ation</i> <i>Any three Function s 1M each</i> |
| | b) Ans. | <p>Explain construction of DVD.</p> <p>Discs are made from a 1.2 mm thick disc of polycarbonate plastic, with a thin layer of aluminum to make a reflective surface. The most common size of CD-ROM disc is 120 mm in diameter, though the</p> | 4M |



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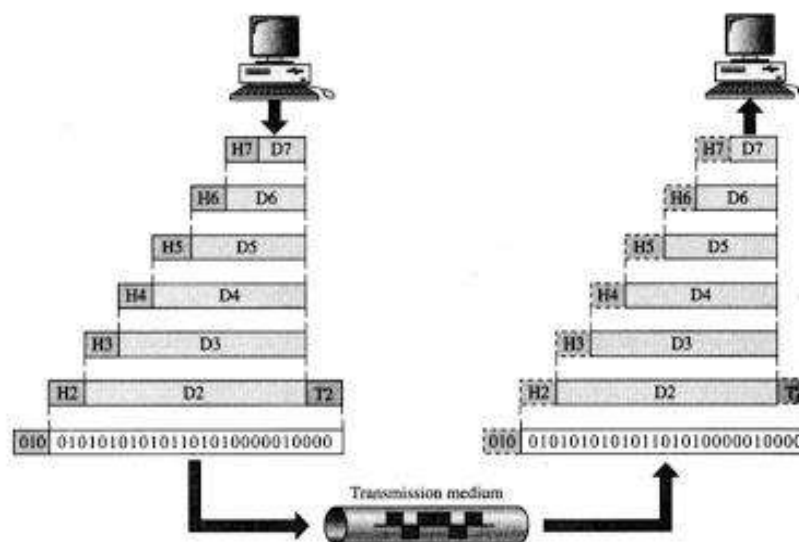
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the physical layer (layer 1), it is changed into an electromagnetic signal and transported along a physical link. Upon reaching its destination, the signal passes into layer 1 and is transformed back into digital into digital form. The data units then moves back up through the OSI layers. As each block of data reaches the next higher layer, the headers and trailers attached to it at the corresponding sending layer are removed, and actions appropriate to that layer are taken. By the time it reaches layer 7, the message is again in a form appropriate to the application and is made available to the recipient.

*Explan
ation 2M*

Encapsulation:

Figure reveals another aspect of data communications in the OSI model; encapsulation. A packet (header and data) at level 7 is encapsulated in a packet at level 6. The whole packet at level 6 is encapsulated in a packet at level 5 and so on. In other words, the data portion of a packet at level 5, and so on. In other words, the data portion of a packet at level N-1 carries the whole packet (data and header and maybe trailer) from level N. The concept is called encapsulation; level N-1 is not aware of which part of the encapsulated packet is data and which part is the header or trailer. For level N-1, the whole packet coming from level N is treated as one integral unit.



*Diagram
2M*

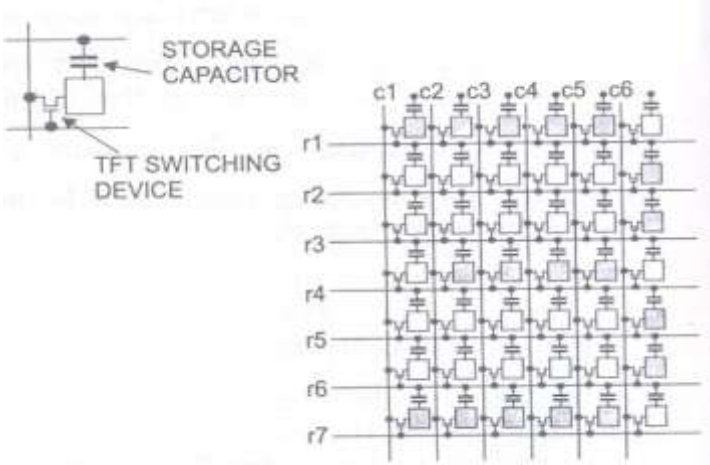


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| | <p>d) Ans.</p> | <p>Explain Active matrix LCD with diagram. Active Matrix LCD: The following diagram shows the Active Matrix LCD arrangement.</p>  <ul style="list-style-type: none">• In this, a switching device (transistor) and a storage capacitor are integrated at the each cross point of the electrodes.• The active addressing removes the multiplexing limitations by incorporating an active switching element.• To address a particular pixel, proper row is switched on and charge is sent down the correct column.• Only the capacitor at the designated pixel receives the charge. Capacitor holds the charge until the next refresh cycle. <p style="text-align: center;">OR</p> <p>Active-matrix LCD: They use one transistor driver for each element. They are the best types of LCD displays. The transistor drivers are arranged in form of matrix form. It is also called as AMLCD. It allows the current through the individual elements to be switched on and off quickly with sufficient current to achieve good contrast. The transistor drivers are fabricated right on the panel substrate using thin film technology. The displays are called as Thin Film Transistor LCD (TFT LCD). As the switching is faster, adjacent elements are not affected. So large currents can be used. But energy consumption is more in this display device</p> | <p>4M</p> <p><i>Diagram 2M</i></p> <p><i>Explanation 2M</i></p> |
| | <p>e) Ans.</p> | <p>List any four advantages of optical mouse. Optical mouse Advantages:</p> | <p>4M</p> |

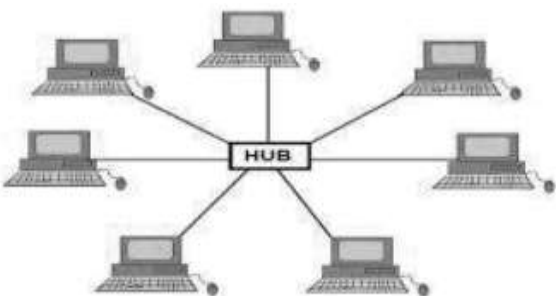


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| | | <ol style="list-style-type: none"> 1) No moving parts: thus less wear & tear 2) Lower chance of failure due to dust: no interference with tracking sensors. 3) No requirement of special surface such as mouse pad. 4) More accuracy than the mechanical mouse. 5) Less maintenance, no cleaning needed. | <p><i>Any four advantages 1M each</i></p> |
| 3. | <p>a)</p> <p>Ans.</p> | <p>Attempt any <u>TWO</u> of the following:</p> <p>What is network topology? Explain star and bus topology with advantages.</p> <p>Network topology: The topology of a network is the geometric representation of the relationship of all the computers or links with linking devices (usually called nodes) to one another.</p> <p>Star Topology:</p> <ul style="list-style-type: none"> • In this topology, all the hosts or workstations are connected to central device called hub. • All the data on the star topology passes through the central device before reaching the intended destination. <div style="text-align: center;">  </div> <p>Advantages:</p> <ul style="list-style-type: none"> • A single computer failure does not affect the entire network. • Easy to expand – Adding new node in Network is easy. • Centralized control-It enhance N/w monitoring & management. • Fault detection is easy because all nodes are connected to central hub. <p>Bus Topology is a network setup in which each computer and network device are connected to a single cable or backbone. Bus uses a common backbone to connect all devices. A single cable, the backbone functions as a shared communication</p> | <p style="text-align: center;">16 8M</p> <p style="text-align: center;"><i>Definition 2M</i></p> <p style="text-align: center;"><i>Explanation 2M</i></p> <p style="text-align: center;"><i>Advantages 1M</i></p> |



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| | <p>5. If the scans are slow no matter how you are connected, consider increasing the size of your PC's swap file or adding more RAM to your system.</p> <p>6. If the scans are coming out blank, make sure you are placing the original face down on a flatbed scanner, or in the appropriate direction in a sheet-fed scanner.</p> <p>7. If the scanned image is blurry or distorted, make sure the original document is placed firmly in or on the scanner, and that the flatbed scanner's cover is closed.</p> <p>8. If the quality of your scans is poor, make sure your scanner or scanner software is set to the appropriate setting for the type of image you are trying to scan.</p> <p>9. If minor errors are found in your scan- it's crooked, or off-center, or too dark or too light use your scanner software or graphics editing software to fix the errors in the scanned image.</p> <p>Printer : Problems:</p> <ul style="list-style-type: none">• Printer not printing at all• Printout quality problems <p>Solution :</p> <ul style="list-style-type: none">• Check and make sure all connections going to and coming from the printer are firmly in place.• Check that the printer is on-line.• Print a test page. If that prints and the application you are using doesn't, contact the application's vendor for support.• Turn off the printer for 10 seconds and turn it back on. Make a note of any error messages or flashing lights when the printer is turned back on.• Reboot the computer. This generally solves most printing problems.• If the printer is connected directly to another computer, try rebooting that computer.• Try to uninstall and then re-install the network printer. <p>For quality problems, check the utilities built into printer's driver.</p> <p>Keyboard: Problem:</p> <ul style="list-style-type: none">• Keyboard not working | |
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| | <p>Solution :</p> <ul style="list-style-type: none">• Check if the keyboard is properly connected to the port• Check for any error by restarting the computer• Check whether the Num Lock and Caps Lock keys are functioning properly while the operating system is booting up• Check for the presence of a fuse in the +5V DC supply and check it for continuity.• Neither the older five-pin DIN nor the six-pin PS/2 mini-DIN keyboards can be hot-swapped. Disconnecting or plugging in a keyboard that has this type of fuse while power is ON can cause the keyboard to fail. If the fuse is present, simply replace it with a fuse of the same type and rating.• If still not working, replace with a new keyboard. <p>Mouse :</p> <p>Problems:</p> <ul style="list-style-type: none">• No mouse pointer on the screen.• Mouse not detected.• The mouse light is on but the pointer doesn't move <p>Solution:</p> <ul style="list-style-type: none">• To plug in a PS2 mouse, the computer must be turned off.• Computers will not recognize a PS2 mouse if the computer is already turned on. For a USB or wireless mouse plug it in with the computer turned on.• If it is an optical mouse, if the computer is turned on, turn over the mouse and verify its light is on. If the light is not on and it's a USB mouse, unplug it and plug it back into the same USB port.• If that doesn't work then unplug it and plug into another USB port on the same computer.• If that doesn't work then swap the mouse with a USB mouse on another computer.• If the mouse doesn't work on the other computer then the mouse is defective and needs to be replaced. If no mouse works on the computer, then there is a problem with the computer USB port.• If the mouse light is on but the pointer doesn't move (or the buttons don't work) then try putting a clean mouse pad under the mouse. If that doesn't work then follow the same steps above as if the mouse light isn't on. | |
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| | <p>(iii) FTP: Meaning: File Transfer Protocol used to transfer files over internet. Functions:</p> <ul style="list-style-type: none">• FTP is a stranded mechanism provided by the Internet for copying a file from one host to the other.• FTP establishes two connections between the client and server. One is for data transfer and the other is for the control information.• The fact that FTP separates control and data makes it very efficient.• The control connection uses simple rules of communication. Only one line of command or a line of response is transferred at a time.• But the data connection uses more complex rules due to the variety of data types being transferred.• FTP uses port 21 for the control connection and port 20 for the data connection. <p>(iv) TCP : Meaning: Transmission Control Protocol used to establish the connection between two computers in a network.</p> <ul style="list-style-type: none">• TCP is a full duplex, connection oriented, reliable and accurate protocol.• When two TCPs in two machines are connected, they are able to send data using segments to each other simultaneously.• Transmission Control Protocol (TCP) is one of the transport layer protocols in the TCP/IP protocol suite.• The unit of data transfer between two devices using TCP software is called a segment; it has 20 to 60 bytes of header, followed by data from the application program.• A TCP connection normally consists of three phases: connection establishment, data transfer, and connection termination. The connection establishment in TCP is called three way handshaking.• TCP uses flow control, implemented as a sliding window mechanism, to avoid bulk data at the receiver.• TCP uses error control to provide a reliable service. Corrupt and lost segments are retransmitted, and duplicate segments are discarded. | |
|--|---|--|