



Winter – 14 EXAMINATION
Model Answer

Subject Code: 17533

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Important Instructions to examiners:

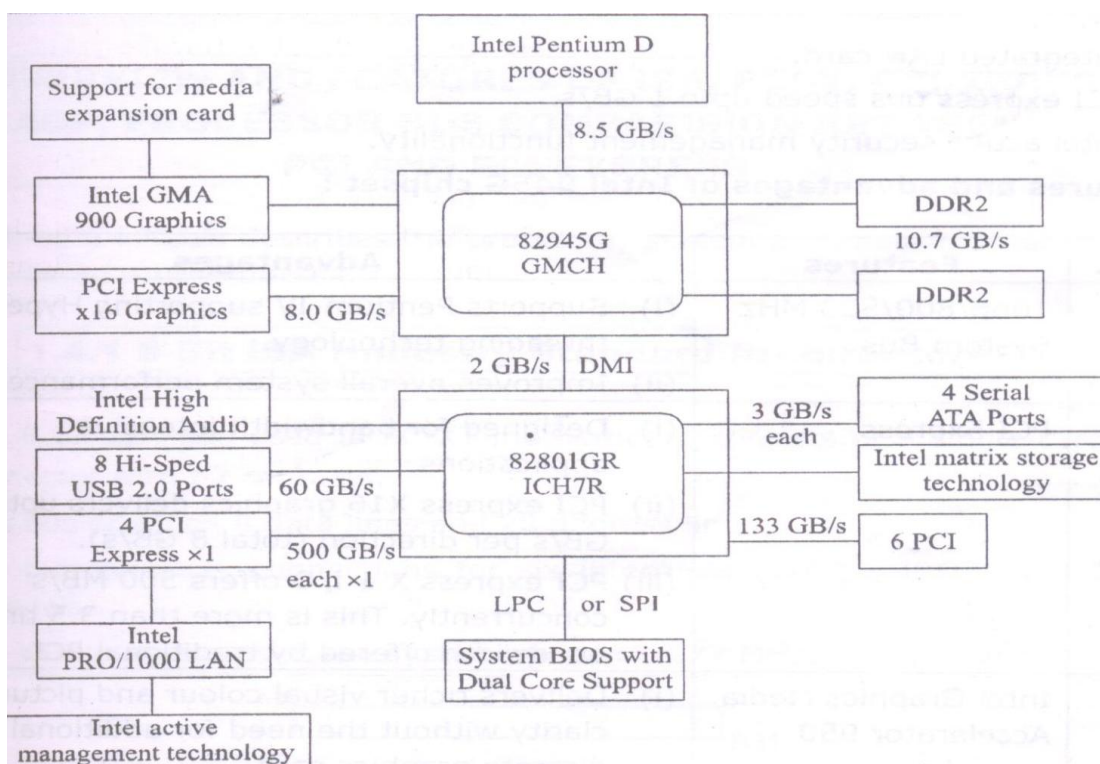
- 1) The answers should be examined by key words and not as word-to-word as given in the model answer scheme.
- 2) The model answer and the answer written by candidate may vary but the examiner may try to assess the understanding level of the candidate.
- 3) The language errors such as grammatical, spelling 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.1.

A. Attempt any three:

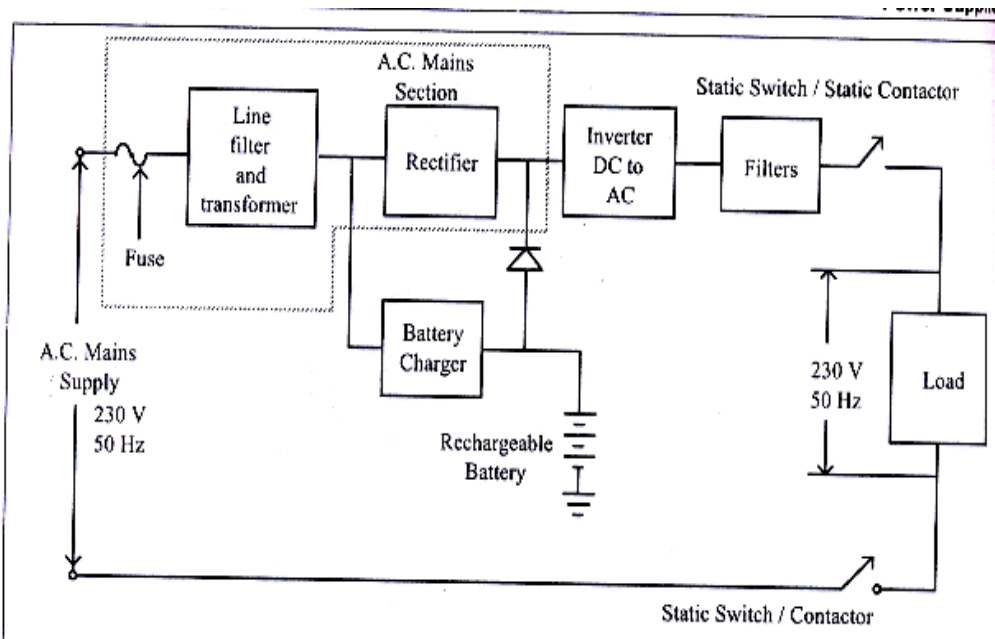
- a) Explain architecture of Intel chipset 945G with Diagram.
(Description 2M Any four points, Diagram 2M)

Architecture of Intel chipset 945G



- 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.

b) **With the help of diagram explain working of UPS**
(Description 2M, Diagram 2M) (Any other correct diagram and corresponding description should be given full credit)



The UPS delivers uninterrupted power to the ac load.

It consists of the following functional blocks:

- AC mains section contains filter, transformer and rectifier-
It receives ac supply, filters it with the help of line filters and rectifies it to the desired level of the load.
- Battery charger with circuit and battery.
It converts the ac supply to the desired dc levels and charges the battery.
It has special protection to prevent overcharging of batteries.
- Static switch / contactor.
In the event of power failure the inverter is connected to the load with the help of switch. The inverter changes from the battery to ac of constant frequency and amplitude.
It also has synchronization circuits for smooth change-over from mains to inverter ac avoid waveform distortion.

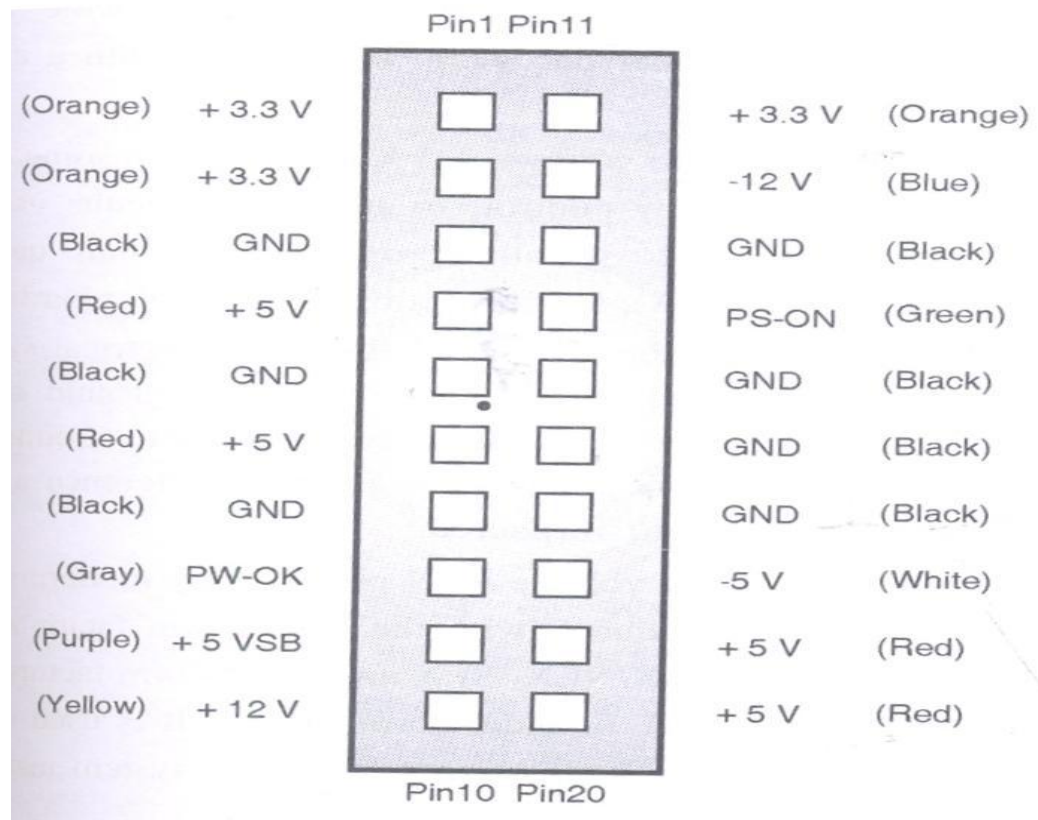


c) Explain the preventive maintenance of printers.(Any four points 1 M each)

1. Clean the exterior of printer using soft cloth with mild organic solvent.
2. Do not place the printer near heat generating machines such as heaters and furnaces.
3. Periodically, clean out dust, paper fragments and dirt from its mechanism using soft brush.
4. Check that the paper feed path is free of obstructions and clean paper feed path, platen and ribbon path with soft cloth.
5. Check and clean the printer head and ink cartridge.
6. Denatured alcohol can be used for cleaning the inner parts such as stepper motor, print heads etc.
7. Test for the satisfactory print quality.
8. The mechanics of different printers vary with their types. So, consult their manuals for their preventive maintenance.

d) Draw the 20 pin ATX power connection with color code and describe the signals.
(Diagram 2 M; Explanation 2M) (Any one diagram can be considered)

20 Pin ATX Power Connection with color code

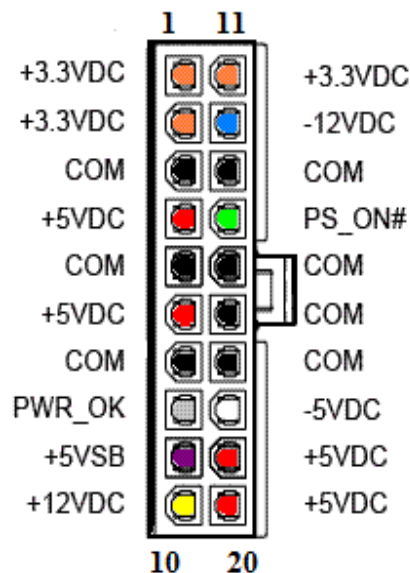




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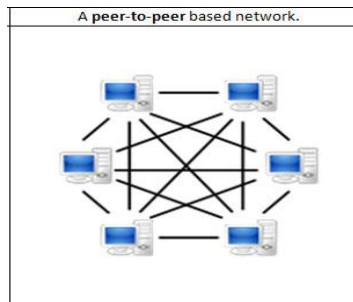
- -12V Used in some types of serial port circuits
- -5V Used for floppy controllers
- 0V Ground
- +3.3V Used in many of the new CPUs, system memory, AGP video cards
- Power Good Signal (PW-OK) The computer will start up only after power good signal has been generated.
- +5 VSB Standby voltage. Which supplies power to special circuits even when SMPS is off
- PS-ON is an input to SMPS only when the signal is low.

B. Attempt any one:

a) **Describe peer to peer and client server networks.(6 Marks, 1M Diagram & 2M Description each)**

Peer to Peer network

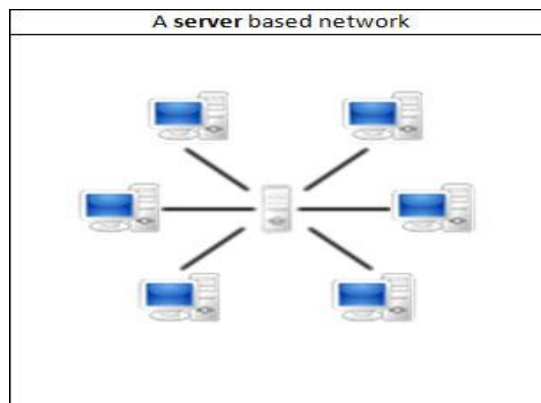
- Peer-to-peer (P2P) is an alternative network model to that provided by traditional client-server architecture.
- P2P networks use a decentralized model in which each machine, referred to as a peer, functions as a client with its own layer of server functionality.
- A peer plays the role of a client and a server at the same time.
- That is, the peer can initiate requests to other peers, and at the same time respond to incoming requests from other peers on the network.
- It differs from the traditional client-server model where a client can only send requests to a server and then wait for the server's response.
- 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.
- Thus, client/server networks possess much more security than do peer-to-peer networks.

Client/server networks also tend to be much more stable.



b) Compare between OSI and TCP/IP reference model.(Any 6 points)
(1M each Point)

TCP/IP	OSI
1) It has four layers.	1) It has 7 layers.
2) It is predated to OSI (1970).	2) It is postdate to TCP/IP (1983).
3) Session layer & presentation layers are absent.	3) Session& presentation layers are present.
4) Protocol came first it model describe the existing protocol .	4) Models were divided first. Doesn't state the protocols to be use.
5) Particularly use in maximum networks.	5) Not particularly use to compare other model.



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6) Can't be used to compose every model.	6) Can be used to compose other model.
7) Network/Internet layer is connection less.	7) N/W layer is both connection oriented & connectionless.
8) Transport layer is both connection less & connection oriented.	8) Transport layer is connection oriented.

Q.2. Attempt any four:

a) Explain BIOS with its any 3 functions.(1M Explanation, 3 Function)

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.

Main functions of BIOS 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.

b) Explain construction of DVD.(Diagram -2M; Explanation -2M)

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.



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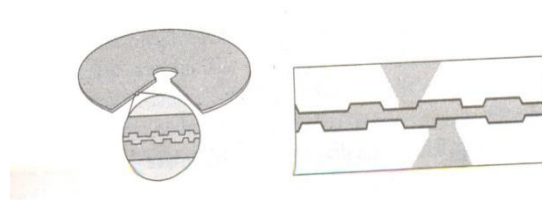
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Once the clear pieces of polycarbonate are formed, a thin reflective layer is sputtered onto the disc, covering the bumps.

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.



c) **Describe data encapsulation.(Diagram -2M; Explanation -2M)**

In figure which gives an overall view of the OSI layers, D7 means the data unit at layer 7, D6 means the data unit at layer 6, and so on. The process starts at layer 7 (the application layer), then moves from layer to layer in descending, sequential order. At each layer, a header, or possibly a trailer, can be added to the data unit.

Commonly the trailer is added only at layer 2. When the formatted data unit passes through the physical layer (layer 1), it is changed into an electromagnetic signal and transported along a physical link.

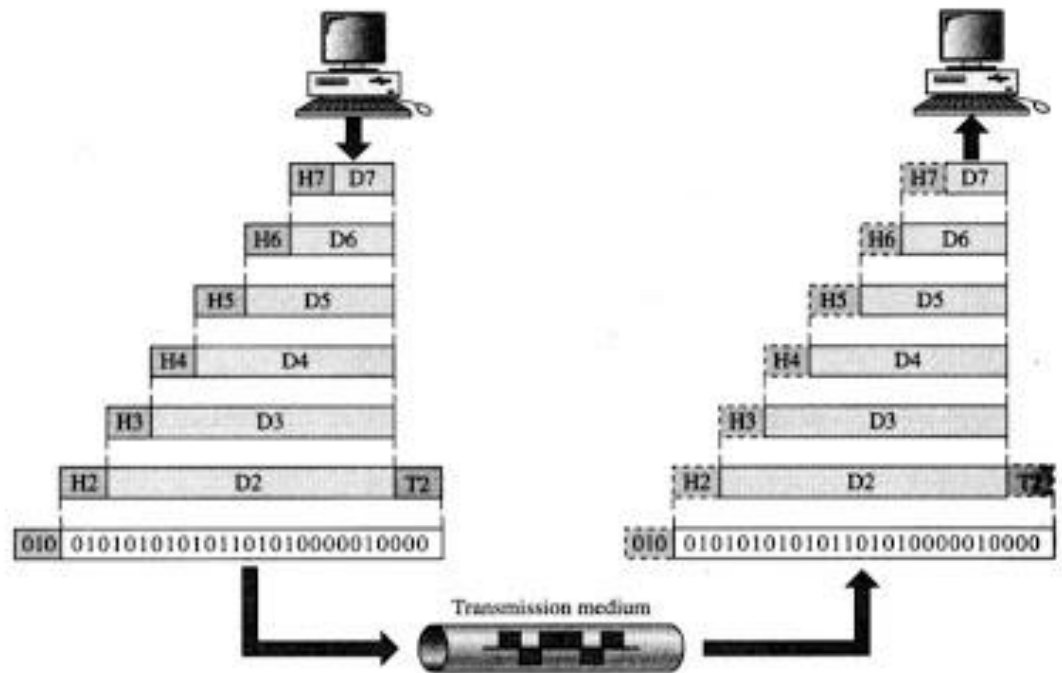
Upon reaching its destination, the signal passes into layer 1 and is transformed back into digital into digital form. The data units then moves back up through the OSI layers. As each block of data reaches the next higher layer, the headers and trailers attached to it at the corresponding sending layer 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.

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.



d) Explain Passive matrix LCD with diagram.

(Diagram -2M; Explanation -2M)

(Any other correct diagram should be given complete marks) Note: Any other diagram showing ROW and COLUMN matrix may be considered

Passive Matrix:

Passive-matrix is a technology that uses a grid of vertical and horizontal wires to display an image on the screen.

Each pixel is controlled by an intersection of two wires in the grid.

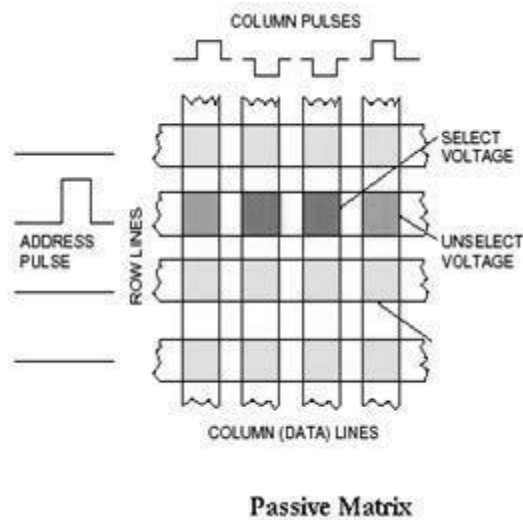
The liquid crystal material is sandwiched between the two glass substrates and a polarizing film is added to the outer side of each substrate. To turn on a pixel, the integrated circuit sends a charge down the correct column of one substrate and a ground activated on the correct row of the other.

By altering the electrical charge at a given intersection, the color and brightness of the corresponding pixel can be changed.

Since the charge of two wires (both vertical and horizontal) must be altered in order to change a single pixel, the response time of passive-matrix displays is relatively slow.

To address a pixel the column containing the pixel is sent a charge, the corresponding row is connected to ground. When sufficient voltage is placed across the pixel, the liquid crystal molecules align parallel to the electric field.

In passive matrix there are no switching devices, and each pixel is addressed for more than one frame time.



e) **List any four advantages of optical mouse.**

(Any 4 pts-1 M each)

Advantages of Optical mouse

1. No moving parts: thus less wear & tear
2. Lesser chance of failure due to dust: no interference with tracking sensors.
3. The cursor accuracy of an optical mouse is typically high as it can analyze changing positions at 700 mm/sec and read up to 200 to 300 dots per inch. This means that it reads its location fast with high precision.
4. The optical mouse can be used on almost any surface as long as the laser can read the surface it is on.:
5. Less maintenance, no cleaning needed.

Q.3. Attempt any Two:

- a) **What is network topology? Explain star and bus topology with its advantages (any 2)**

Definition: 1 M; Explanation of Star & Bus 3 M; advantages of Star (Any 2) & Bus (Any 2) 2M each

Topology of LANs

Networks can be laid out in different ways. The physical layout, or shape of network, or the way in which network connections are made is called a topology. It refers especially the locations of computers and how the cable is run between them. It is important to select the right topology for how the network will be used.

Bus topology

In a bus topology the computers are connected in a line, the cable is just one or more wires; pass it along from computer to computer. It is a passive topology.

When one computer sends a signal up (and down) the wire, all the computers on the network receive the information, but only one (the one with the address that matches the one encoded in the message) accepts the information.

The rest disregard the message. Only one computer at a time can send a message; therefore, the number of computers attached to a bus network can significantly affect the speed of the network.

A computer must wait until the bus is free before it can transmit.

Figure 1 shows Bus network.

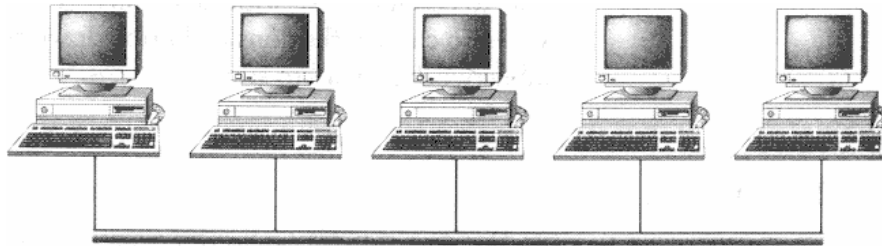


Figure 1: All computers are connected to common channel (BUS)

The important issue in bus networks is termination. Since the bus is a passive topology, the electrical signal from a transmitting computer is free to travel the entire length of the cable.

Without termination, when the signal reaches the end of the wire, it bounces back and travels back up the wire.

When a signal echoes back and forth along an un-terminated bus, it is called ringing.

To stop the signals from ringing, you have to attach terminators at either end of the segment.

The terminators absorb the electrical energy and stop the reflections. Cables cannot be left un-terminated in a bus network.

Advantages

- Simple, easy to use, and suitable for very small networks
- Least amount of cable is required to connect the computers together and therefore it is less expensive.
- Easy to extend a bus, two cables can be joined with a BNC barrel connector, allowing more computers to join the network.

Star Topology

A star network is one in which all the cables run from the computers to a central location, where they are all connected by a device called a hub. Figure 2 shows a star topology.

Each computer on a star network communicates with a central hub that resends the message either to all the computers (in a broadcast star network) or only to the destination computer (in a switched star network). The hub in a broadcast star network can be active or passive.

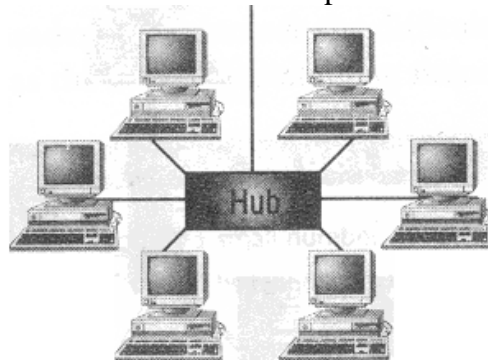


Figure 2: In a star topology the computers are all connected by Cables to a central point



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Advantages

- It is easy to modify and add new computers to a star network without disturbing the rest of the network.
- Hub can accommodate multiple cable types.
- Fault finding becomes very simple
- Single computer failure does not bring down the whole network
- It is more flexible among the remaining topology.

b) Explain keyboard, hard disk, mouse and scanner related problems.

(Any 2 problems explained each carrying 1Mark.)

Keyboard Problems:

1. During initialization, “No keyboard error “ displayed or Complete non operation of the keyboard. „KEYBOARD FAILURE“ message is displayed when booting.
Solution: Check the keyboard cable and ensure that it is connected properly into the PC connector. Reboot the system; Try with another compatible keyboard.
2. The keyboard completely dead; no keys appear to function at all
Solution: Check with another good keyboard; reboot system. Check the keyboard connector for +5V supply. If still doesn't work keyboard chip is at faulty.
3. Keyboard not functioning normal, some keys stuck or repeating
Solution: Short or jammed key. Some paper clips or other objects creating short circuit. Clean the contacts and check. If keys are still not working, replace with old keys or replace keyboard assembly.

Hard disk problems:

1. The hard disk is completely dead
Solution: Make sure the hard disk supply and data connector connected properly. Check the CMOS setup for the recognition of the hard disk; save CMOS setting and reboot.
2. System does not boot up.
Solution: This can be either the boot sector failure or OS file corruption. Make sure the drive is connected properly; check the CMOS settings. Boot from some other devices and check for the recognition of drive.
3. Can't read from “C” drive
Solution: Check the disk using Scandisk utility for bad sectors. It may also indicate viruses; check for the antivirus utility.
4. Disk boot failure / Non system disk
Solution: Check the signal connector and make sure the data interface signal cables are inserted properly and completely at the drive and controller. Try with new cables. Check for CMOS setup.

Mouse Problems:

1. The mouse cursor appears, but it only moves erratically as the ball moves
Solution: Check for the cable and connector for its proper connection. Check for the connector pins.
2. The screen cursor appears on the display, but it does not move
Solution: The above symptom shows that device driver is loaded properly and application program is communicating. Check the serial connection for bad communication.
3. The mouse works for a few minutes, then stops
Solution: This problem occurs in mechanical mouse; for the faulty mouse circuitry.
4. A single mouse click works, but double click doesn't
Solution: This problem is because the double click speed is set too high in the operating system. Change the properties of mouse and correct the same.



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Scanner Problems:

1. Common scanner problems include the inability to scan and poor- quality results.
2. Scanner's arm not moving indicating the lock at the bottom of the scanner not unlocked.
3. Slower Scanner can be made faster by increasing the RAM so that swap file size is increased.
4. If the image is blurry or distorted, make sure the original document is placed firmly and cover is closed properly.
5. If the quality of the image scanned is poor, make sure the scanner and scanner software is set to the appropriate setting for the type of image being scanned.

c) Explain following terms:

- i. Subnet masking**
- ii. ARP**
- iii. FTP**
- iv. IP address classes.**

Each term 2M

i. Subnet mask:

Subnet mask is a 32bit number associated with an IP address. It allows the user to identify which part of an IP address is reserved for the network and which part is available for the host. A bit with '1' in the mask indicates the corresponding bit in the IP address is a part of the network identifier, While a bit with '0' in the mask indicates the corresponding bit in the IP address is a part of the host identifier.

Default subnet mask for different classes are as given below.

Class A : 255.0.0.0

Class B : 255.255.0.0

Class C : 255.255.255.0

E.g.: 255.255.255.0, implies that 24 bits are used for networking and 8 bits for hosts and it is the default subnet mask for Class C IP addresses.

ii. Address Resolution Protocol (ARP)

Address Resolution Protocol provides IP-address to MAC address resolution for IP packets. The Address Resolution Protocol (ARP) can determine the physical address used by the device containing the IP address. ARP maintains tables of address resolution data and can broadcast packets to discover addresses on the network segment or use previously cached entries. The physical addresses discovered by ARP can be provided to Data Link layer protocols. All addresses in the ARP table are only local addresses.

iii. File Transfer Protocol (FTP)

The File Transfer Protocol (FTP) is a protocol for sharing files between networked hosts. FTP enables users to log on to remote hosts. Logged-on users can inspect directories, manipulate files, execute commands, and perform other commands on the host. FTP also has the capability of transferring files between dissimilar hosts by supporting a file request structure that is independent of specific operating systems.



iv. IP Address Classes:

There are currently A, B, C, D, and E classes of addresses in IPv4. The unique address given to a machine is derived from the Class A, B, or C addresses. Class D addresses are used for combining machines into one functional group i.e., multicasting and Class E addresses are considered experimental for research and are not currently available.

