CT-01

01. (a) Draw the flowchart that shows the different catagories of the crosspoint technology? — 6

(b) Draw the circuit switching diagram? — 4

(c) Write down the advantages and disadvantages of a muttage network? — 4

02. (a) What is dial tone? List five subscriber related signaling function that are to be performed by the operator? — 6

(b) which switching method reduces traffic congestion? — 3

(c) what are the disadvantages of message switching? — 5

03. (a) what is direct control switching system and what are the benefits of acctomatic switching system? — 5

(b) what are the dereferences between circuit switching and pocket switching? — 5

(c) List four types of connection in a telecommunication network? — 4

04. (a) What are the two approaches packet switching? — 2

(b) What are the difference between circuit switching and message switching? — 6

(c) List the three traditional switching methods. what are the most common today? — 2

(d) Describe the need for switching and Define switch? — 4

05. (a) What are the drawbacks of circuit switching? — 4

(b) What are the advantages of packet switching over circuit switching? — 6

(c) List four major components of a packet switch and their functions? — 4.

06. (a) What are the deferming the design of a switching system? — 5

(b) How to use a rotary dial phone for impkenting pl pulse dialing? — 6

(c) What is LATA? what are intra-LATA and intra-LATA services? — 3

07. (a) Define circuit switching. what are the benefits of circuit switching? — 5

(b) what are the features of crossbar switch? — 4

(c) Define electro mechanical crosspoint technology. What are the challenges for the crosspoint technology? — 5

08. (a) Define layer. Write down the function of the node processor. — 5

(b) Define network layer. Write down the step by step performance of a routing algorithm? — 5

(c) what do you mean by LAN with some example? — 2

(d) Write down benefits of the application layer? — 2

Ans to the Q no - 01 (a)

Different catagories of the crosspoint technology:

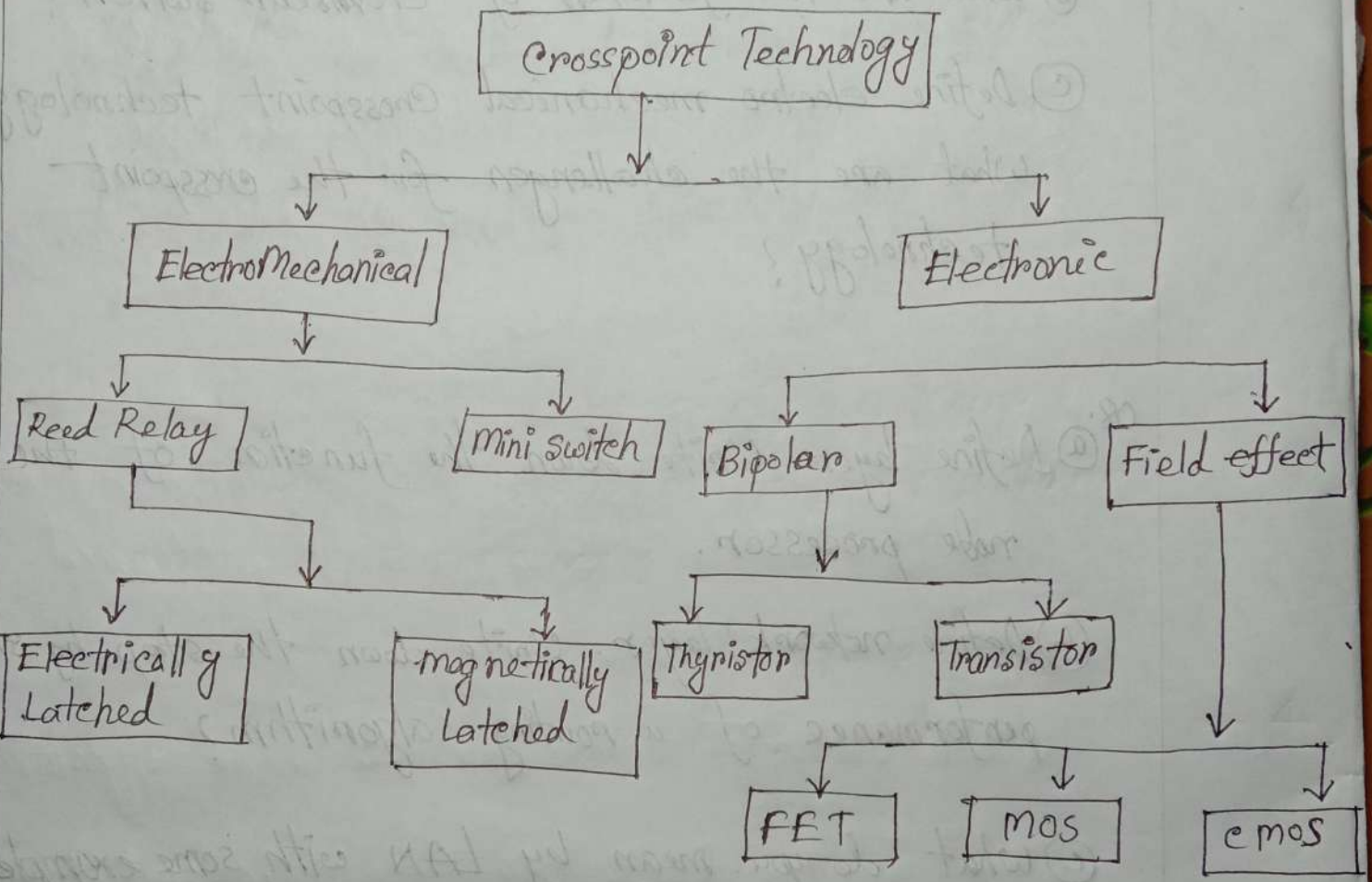

Fig: Different catagories of the Crosspoint technology.

Ans to the Q no - 01(b)

In this type of switching, there is a set of switches connected with physical links. Here once the dedicated path is established between the sender and receiver, it stays the same until one of the users terminates the connection.

There are three phases in the establishment of a circuit switching network. They are -
Circuit establishment, Data transfer and Circuit Disconnect.

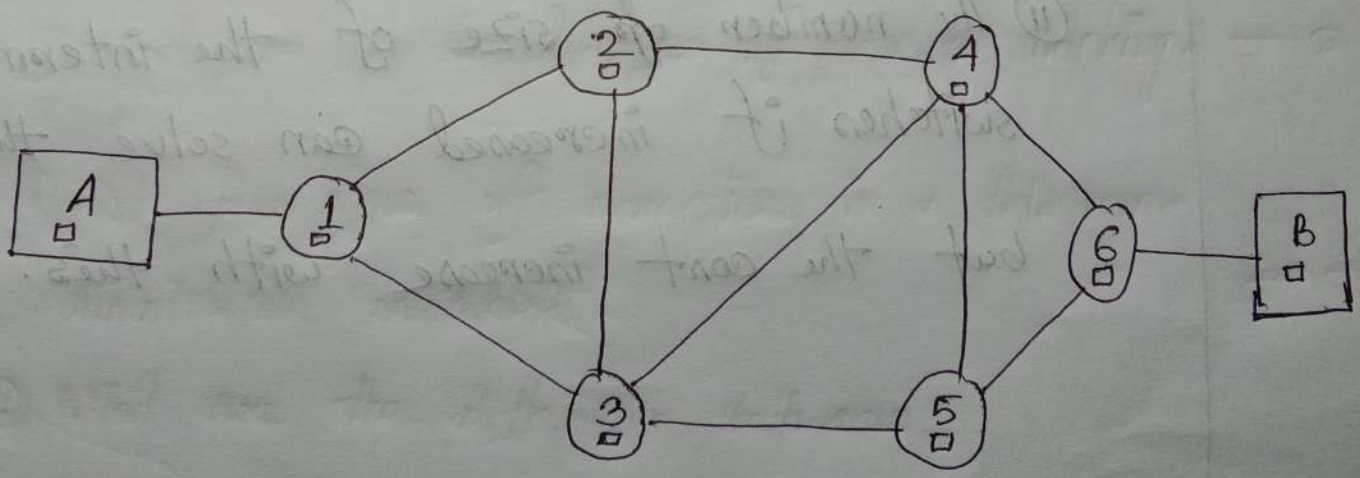

Fig: Circuit Switching

Ans to the Q.no-01(c)

The advantages of a multistages network are as follows:

(i) The number of Crossbars are reduced.

(ii) The number of paths of connection can be more.

The Disadvantages of a multistages network are as follows:

(i) Multistages switches may be cause blocking.

(ii) The number of size of the intermediate switches if increased can solve this problem. but the cost increase with this.

Ans to the Question no-02(a)

Dial tone: The dial tone is the signaling tone, which indicates that the exchange is ready to accept the dial digits from the subscriber.

Five subscriber related signaling function:

(I) Respond to the calling subscriber that system is ready to receive the identification of the called party.

(II) Inform the calling subscriber that the call is being established.

(III) Ring the bell the called party.

(IV) Inform the calling subscriber if the called party is busy.

(V) Inform the calling subscriber if the called party line is unobtainable for some reason.

Ans to the Question no-02(b)

Congestion is a system of an overloaded network. Packet switching is more efficient than circuit switching because it ensures that more of the bandwidth of all cables are fully utilized. As it makes better use of resources, Packet switching is more likely to reduce congestion than circuit switching.

Ans to the Question no-02(c)

Following are the disadvantages of message switching type:

(I) This switching type is not compatible for interactive application such as voice and video.

(II) This method is costly as store and forward devices are expensive.

(III) It can lead to security issues if hacked by intruders.

(IV) As the system is complex.

(V) Message switching type does not establish dedicated path between the devices.

Ans to the Question no-3(a)

Direct control switching System:

The switching systems where the control sub system from an integral part of the network are called the direct control switching system.

Benefits of automatic switching system:

→ Language barries will not affect the request for connection.

→ Higher degree of privacy is maintained.

→ Faster Establishment and release of calls is done.

→ Number of calls made in a given period can be increased.

→ Calls can be made irrespective of the load on the system or the time of the day.

Ans to the Question no-03(b)

Defference between circuit switching and packet switching is given below:

Feature	circuit switching	Packet switching
Dedicated Path	Yes	No
Path formation	Path dedicated for one conversation	Route is established on per packet switching basis of the conversation diagram.
Delay	Call setup delay	Packet transmission delay
Bandwidth type	Fixed Bandwidth	Dynamic Bandwidth
Overload effects	Stops call establishment	Increases packet delay.

Ans to the Question No-03(c)

There are four types of connections that can be established in telecommunication network. The connections are as follows:

(I) Local call connection between two subscriber in the system.

(II) Outgoing call connection between a subscriber and an outgoing trunk.

(III) Incoming call connection between an incoming trunk and a local subscriber.

(IV) Transit call connection between an incoming trunk and an outgoing trunk.

Ans to the Question no-04(a)

Two Approaches of packet switching:

① Datagram approach and
② Virtual circuit Approach.

Ans to the Question no-04(b)

Difference between circuit switching and message switching:

Circuit switching	message switching
① Data is not stored.	① Data is first stored, then forwarded to the next node.
② Needs dedicated physical path.	② Not need dedicated physical path
③ A Geographical addressing	③ A Hierarchical addressing
④ Costlier than message switching	④ The cost of message switching is less than circuit switching.
⑤ Routing is manual type routing.	⑤ Routing is not manual type routing.
⑥ charge depend on time and distance	⑥ charge is based on the number of bytes and distance.

Ans to the Question no-04(c)

There are three traditional switching methods. There are:

(i) circuit switching
(ii) Packet switching
(iii) Message switching.

circuit switching and Packet switching are the most comaon today.

Ans to the Question no-04(d)

Need for swithing

(i) Switching provides a practical solution to the problem of connecting multiple devicen in a network.

(ii) It is more practical than using a bus topology.

(iii) It is more efficient than using a star topology and a central hub.

Definition of switch:

Switch: Switcher are devices capable of creating temporary connections between two or more devicen linked to the switch.

Ans to the Question no-05(a)

Drawbacks of circuit switching:

→ Circuit switching establishes a dedicated connection between the end parties.

→ Bandwidth requirment is high even in cases of low data volume.

→ There is underutilization of system resources.

→ Time required to establish connection may be high.

Ans to the Question no-05(b)

This switching offers various benefits compared to circuit switching and there are listed below:

→ It delivers the data to a destination by finding ~~there~~ their own paths, circuit switching has dedicated and predifined channel.

→ It is high reliable as missing packets are detected by destination, circuit switching does not have their option

→ It uses lessens bandwidth as packets are quickly routed towards the destination, circuit switching

should have dedicated bandwidth.

→ The channel in packet switching is available for other transmissions as soon as packets are routed, circuit switching occupies the channel till the voice communication is completed.

→ It is cost effective and easier to implement circuit switching is expensive.

Ans to the Question no - 05(c)

A packet switching has four components:

(I) input ports: An input ports performs the physical and data link functions of the packet switch.

(II) output ports: The output ports performs the same function as the input port, but in the reverse order.

(III) Routing processor: The routing processor performs the function of table lookup in the network layer.

(IV) Switching fabric: The switching fabric is responsible for moving the packet from the input queue to the output queue.

Ans to the Question no-06(a)

In order to determine the best design for a telephone switching system, a number of criteria must be determined and considered by the operator.

Traffic intensity of the busy-hour:

Perhaps the most important factor, traffic intensity of the busy hour is simply, the calling rate + (plus) the average holding time during the 60-minute period that the traffic intensity is at its highest.

Calling rate:

This is the average number of request for connection per unit of time.

Holding time:

This is the mean amount of time that a call lasts.

Building, maintaining and improving switch:

In order to build, maintain and improve a switch that will supply the highest quality of service to its subscribe network operators, must monitor their network hardware constantly and efficiently and be ready to repair, replace or add any parts that are required.

Ans to the Question no-06(b)

A rotary dial phone uses the following for implementing pulse dialing:

(I) Finger plate and spring.

(II) Shaft, gear and pinion wheel.

(III) Pawl and ratchet mechanism.

(IV) Impulsing cam and suppressor cam or a trigger mechanism.

(V) Impulsing contact.

(VI) centrifugal governor and worm gear.

(VII) Transmitter, receiver and bell by pass circuit.

Ans to the Question no-06(c)

LATA:

A LATA is a small or large metropoliton area that according to the divestiture of 1984 was under the control of a single telephone service provider.

Intra LATA and inter LATA services:

The services ~~order~~ offered by the common carriers

inside the LATA are called intra LATA services. The services between LATAs are handled by inter exchange carriers (IXCs). These carrier, sometimes sometimes called long distance companies, provide communication services between two customers in different LATAs.

Ans to the Question no-07(a)

Circuit switching: This method of switching establishes a dedicated communication path between the sender and receiver.

Some of the benefits of circuit switching are as follows-

(I) It uses a fixed bandwidth.

(II) A dedicated communication channel increase the quality of communication.

(III) Data is transmitted with a fixed data rate.

(IV) No waiting time at switches.

(V) Suitable for long continuous communication.

Ans to the Question no-07(b)

In this section, we will discuss the different features of the crossbar switches.

(i) while processing a call, the common control system helps in the sharing of resources.

(ii) The specific route functions of call processing are hardwired because of the wire logic computers.

(iii) The flexiable system design helps in the appropriate ratio selection is allowed for specific switch.

(iv) Fewer moving parts ease the maintainance of crossbar switching system.

Ans to the Question no-07(c)

Electromechanical Crosspoint Technology:

The Electromechanical Crosspoints ~~Technology~~ switches which are capable of making and breaking contacts in 1-10 ms of time duration for several million times without any wear and tear.

In this section, we will discuss the challenges

associated with the crosspoint Technology. The challenges are describe below:

(I) Reduction in the size of a crosspoint.
(II) Reduction in the cost of a Crosspoint.
(III) Improvisation of the switching time.
(IV) Electromechanical
(V) Electronic.

Ans to the Question no-08(a)

Layer: A Layer is composed of subsystems of the same rank of all the interconnected systems.

Function of node processor:

(I) Receieve the full user message and store the same.
(II) Determine the destination address ofrom the user message.
(III) choose an appropiate link towards destination based on certain routing criterion.
(IV) Forward the message to the next node on the choosen link.
(V) check the message for data transmission errors and perform error recover if required.

Ans to the Question no-08(b)

Network Layer:

The highest link to link layer in the OSI model is the network layer. Although this layer function on a link to link basis, it is concerned with transmission of packets from the source node to the destination node.

A number of measures may be used in accessing the performance of a routing algorithm:

(i) Minimum delay.

(ii) Minimum number of intermediate nodes or hops.

(iii) Processing complexity.

(iv) Signaling capacity required on the network.

Ans to the Question no-08(c)

LAN: A Local Area Network (LAN) typifies a distributed environment and finds application in a number of areas. Some examples are:

(i) Office Automation
(ii) factory automation
(iii) Distributed computing.
(iv) Fire and security system.
(v) Process Control.
(vi) Document distribution

Ans to the Question no-08(d)

Benefits of Application Layer:

(i) Directory services.
(ii) Cost allocation.
(iii) File transfer and management
(iv) Editors and terminal support services.
(v) Telematic services like videotex.