CT # Assignment # 01 — Unit - I & III

IT-17026

8-set question.

01. a. what is telecommunications? — 2

b. Describe different components of a telecommunication system? — 6

c. Explain telecommunication network briefly using figure? — 6

02. a. what is switching systems? — 2

b. Describe about classification of switching system? — 7

c. what are the difference between Circuit switching and message switching? — 5

03. a. Describe about Packet switching? — 2

b. List four major component of a packet switch and their functions? — 4

c. what are the advantages of packet switching over Circuit switching? — 6

d. what are the drawbacks of Circuit switching? — 2

04.

a. Define a switch? — 2

b. Describe the need for switching? — 3

c. List the three traditional switching methods, which are the most common today? — 4

d. What are the difference between Circuit switching and packet switching? — 5

05. a. List four types of connections in a tele. network? — 4

b. what is direct control switching system and what are benefits of automatic switching system? — 5

c. what are the two approaches Packet switching? — 5

6. a. what is LATA? — 2

b. what are the determining the design of a switching system — 6

c. How to use a rotary dial Phone for implementing pulse dialing? — 6

07. a. What is Crossbare switch? – 2
b. What are the features of Crossbare switches? – 4
c. Write down the advantages and disadvantages of a multistage network? – 4
d. Write down the functions of the node processor? – 4

08. a. Define about layer? – 2
b. Define network layer. Write down the step by step performance of a routing algorithm? – 5.
c. Write down benifits of the application layer? – 3
d. What do you mean by LAN within some examples? – 4

Answer

Ans. to the Ques. No: 01 (a)

The word "-tele" is a Greek word which means distance. Hence, Telecommunication means the exchange of information between two distant places.

Telecommunication represent the transfer of information from an entity at one place to an entity at another place.

Ans, to the Ques, No: 01 (b).

A telecommunication system includes a transmitter to take information and convert it to a signal, a transmission medium to carry the signal and a receiver to take the signal and convert it back into usable information.

This applies to any communication system, whether it uses computers or not.

There are six basic components to a telecommunication network

1. Input and output devices, also referred to as 'termi
2. Telecommunication channels, which transmit and receive data. This includes various types of cables and wireless radio frequencies.

3. Telecommunication processors, which provides a number of control and support functions.
For examples, In many systems, data needs to be converted from analog to digital and back.

4. Control software, which is responsible for controlling the functionality the functionality and activities of the network.

5. messages represent the actual data that is being transmitted.

6. protocols specify how each type of telecommunication system handle the messages.
For example, GSM and 3G are protocols for mobile communications, and TCP/IP protocol for Internet.

Ans, to, the, Ques. NO: 01(c)

A telecommunication network is a group of systems that establishes a distant call. The switching systems are part of a telecommunication network.

The switching station provide connection between different subscriber.

The switching system are connected using lines all it

The lines that run to the subscriber premises are called the subscriber lines.

The following figure shows a telecommunication network.

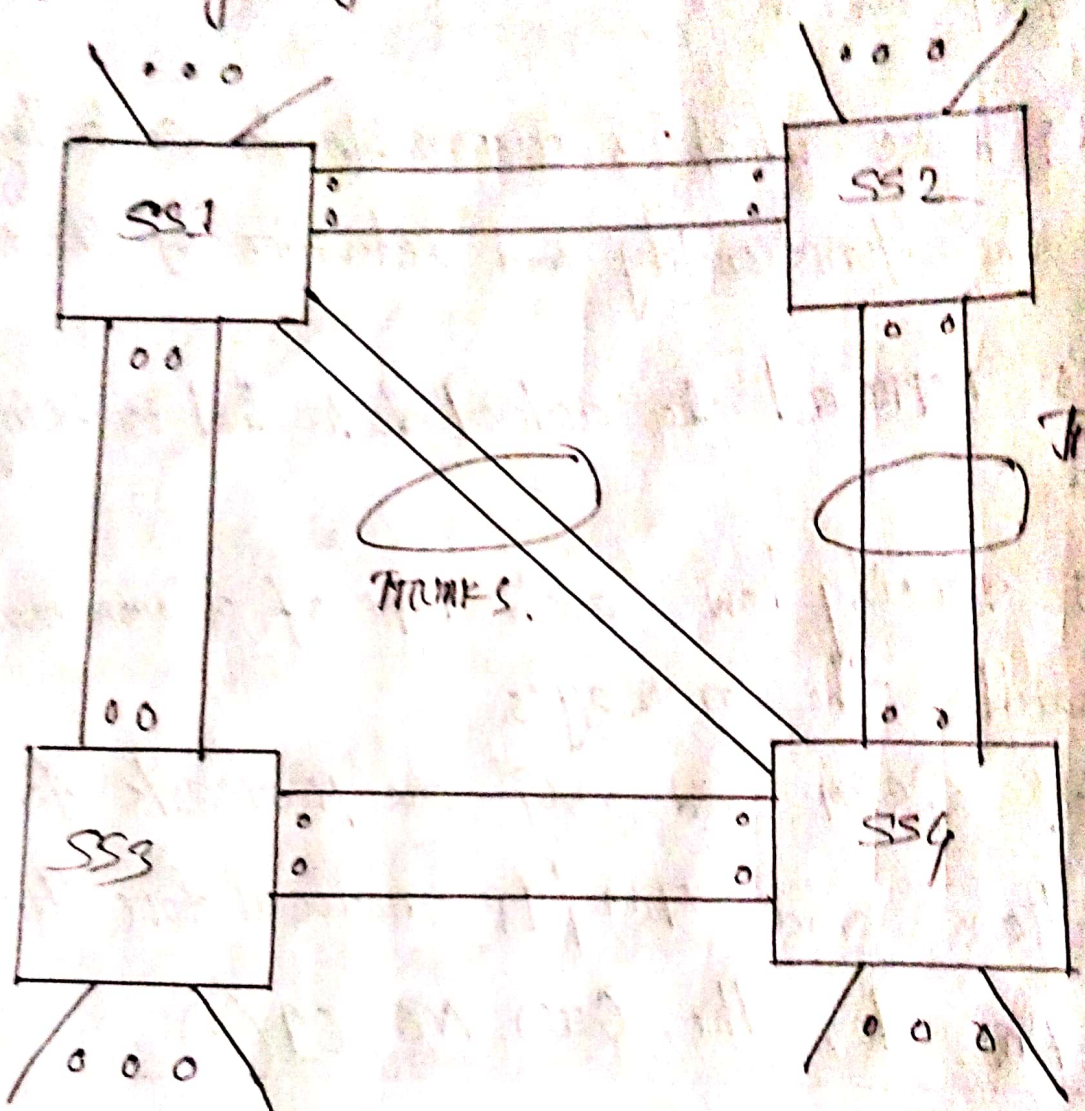

Fig: Telecommunication network.

Ans, to, the, Ques, No: 02(a)

An electronic switching system is a telephone switch that uses solid-state electronics, such as digital electronics and computerized common control, to interconnect telephone calls circuits for the purpose of establishing telephone calls.

Ans, to, the, Ques, No: 02(b).

In the early stages of telecommunication systems, the process and stages of switching, played an important task to make or break connections. At the initial stages, the switching systems were operated manually. These systems were later automated.

The following flowchart shows how the switching systems were classified.

The switching systems in the early stages were operated manual The connections were made by the operator at the telephone exchanges in orderc to establish a connection To minimize this disadvantages of manual operation

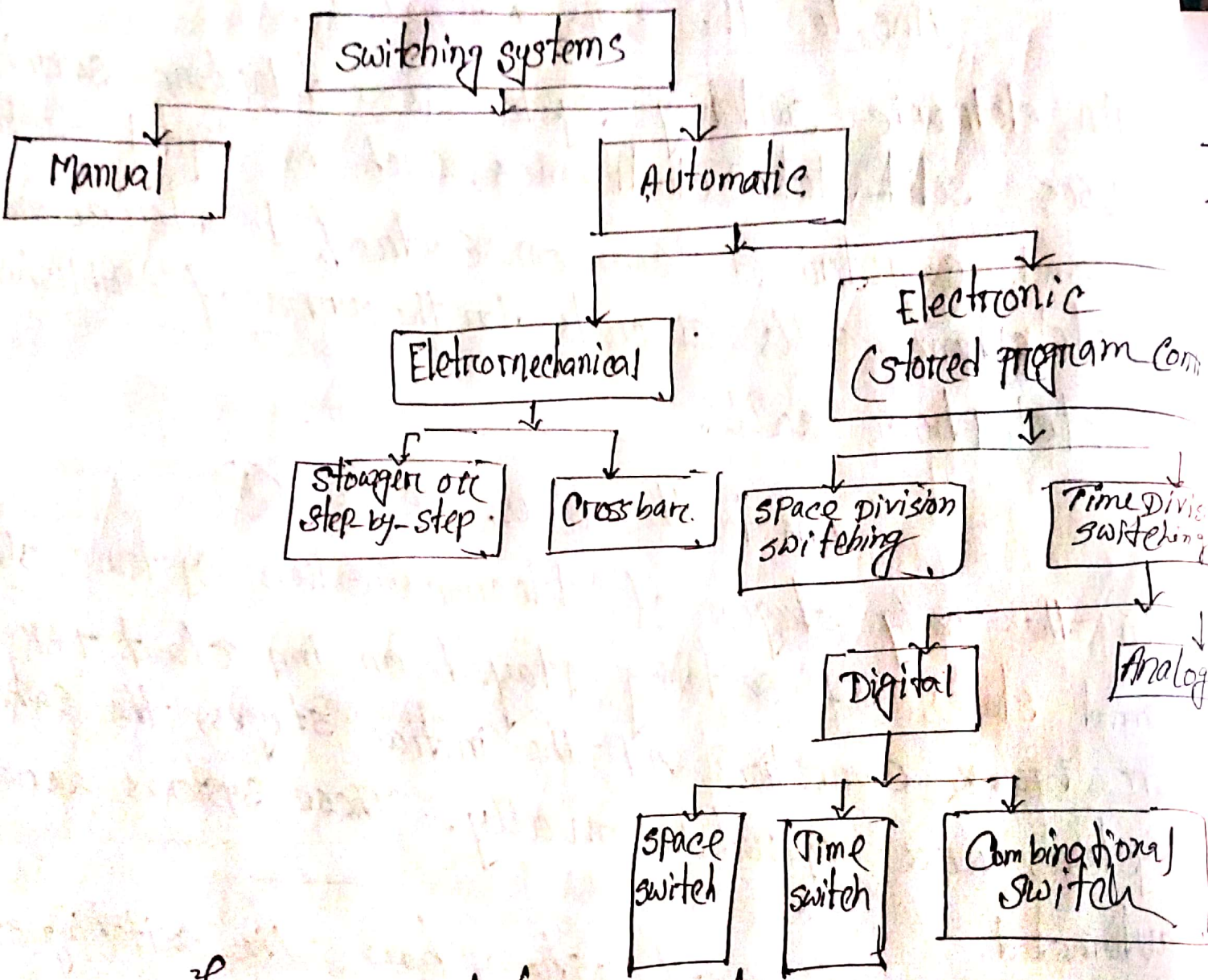

Fig: Switching systems.

Ans. to the Ques No: 02 (C).

Circuit switching	Message Switching
1. Data is not stored	1. Data is first stored, then forwarded to 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 ques. no: 03 (a).

In telecommunications, packet switching is a method of grouping data that is transmitted over a digital network into packets.

Packets are made of a header and a payload.

Ans. to the ques. no: 03 (b).

A packet switch has four components:

i. Input ports: An input port performs the physical and data link functions of the packet switch.

ii. Output ports: The output ports performs the same functions as the input port, but in 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 Ques. no. 03 (c).

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

i. It delivers the data to a destination by finding their own paths; circuit switching has a dedicated and predefined channel.

ii. It is highly reliable as missing packets are detected by destination; circuit switching does not have this option.

iii. It uses lesser bandwidth as packets are quickly routed towards the destination;

Circuit switching should have dedicated bandwidth.

Ans. to the Ques. no: 03 (d).

Drawbacks of circuit switching.

i. Bandwidth requirement is high even in cases of low data value.

ii. There is undercutilization of system resources.

ii - Time required to establish connection may be high.

Ans. to the Ques. no: 04(a).

A network switch is networking hardware that connects devices on a computer network by using packet switching to receive and forward data to the destination device.

Ans. to the Ques. no: 04(b).

Need for switching.

a. Switching provides a practical solution to the problem of connecting multiple devices in a network.

b. It is more practical than using a bus topology.

c. It is more efficient than using a star topology and a central hub.

Ans. to the Ques. no: 04 (c).

Switching methods:-

The three traditional switching methods are:-

i. Circuit switching.
ii. Packet switching
iii. Message switching.

The most common today are Circuit switching & packet switching

Ans, to, the Ques no: 04(d).

Circuit switching	packet switching.
1. it has a dedicated path	1. There is no dedicated path
2. path dedicated for one conversation.	2. Route is established on a per packet basis of the conversation using datagram
3. Call Setup delay.	3. packet transmission delay.
4. Fixed Bandwidth.	4. Dynamic bandwidth.
5. stops call establishment	5. Increases packet delay.

Ans, to, the Ques No: 05(a).

There are four types of Connection that can be established in a telecommunication network. The connection are as follo

- Local call connection between two subscribers in the system
- outgoing call connection between a subscriber and an outgoing trunk.
- Incoming call Connection between an incoming trunk and a local subscriber.
- Transit call Connection between an incoming trunk and an outgoing trunk.

Ans, to, the, Ques. No: 05 (b)

Direct control switching system:

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

Benefits of automatic switching system:

- Language barriers will not affect the request for connec
- Higher degree of privacy is maintained.
- Faster establishment and release of calls is done.
- Number of calls made in a given period can be incre

Ls calls can be made irrespective of the load on the system or the time of the day.

Ans, to, the, ques. no: 05 (c).

Approaches to packet switching.

There are two approaches to packet switching

i. Datagram approach and virtual

ii. Virtual circuit approach

Ans, to, the, ques. no: 06 (a)

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

Ans, to, the, ques, no: 06 (b).

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 subscribers, 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 Que. no: 06(c).

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 on a trigger mechanism.
v. Impulsing contact
vi. Centrifugal governor and worm gear
vii. Transmitter, Receiver and bell by pass circuits

Ans. to the Ques. no: 07(a)

A crossbar switch is an assembly of individual switches between a set of inputs and a set of outputs. The switches are arranged in a matrix.

Ans. to, the Ques no: - 07 (b).

Different features of the crossbar switch are as follows;

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 flexible system design helps in the appropriate ratio selection is allowed for a specific switch.

iv. Fewer moving parts ease the maintenance of Crossbar switching system.

Ans. to, the Ques. no: 07 (c).

The advantages of a multistage 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 multistage network are as follows:

i multistage switches may cause blocking

ii The number or size of the intermediate switches if increased can solve this problem, but the cost increases with this.

Ans. to the Que. no: 07 (d).

Functions of node processor:

i. Receive the full user message and store the same.

ii Determine the destination address from the user message

iii. Choose an appropriate link towards destination based certain routing criterion.

iv. Forward the message to the next node on the chosen link

v. Check the message for data transmission error and perform error recovery if required.

Ans, to, the, Ques. No: 08 (a)

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

Ans, to, the, Ques. No: 08(b).

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

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, Ques. No: 08(c).

Benefits of the application layer:

i. Directory Services.
ii. Cost allocation.
iii. File transfer and management.
iv. Editors and terminal support Services.

v. Telematic services like videotex.

Ans. to the ques. no: 08 (d).

LAN: A local area network (LAN) typifies a distributed environment and binds 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.