

Sub: _____

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Time: _____

Date: / /

Class Test - 03

1

- a) What is dial-up modem technology?
~~List~~ List some of the common modem standards? — 3
- b) List the seven steps to successful analog to digital signal conversion. — 6
- c) Define private Branch Exchange or PBX. List the parts of a PBX? — 5

02

- a) Define blocking in a switched network? — 4
- b) A path in a digital circuit-switched network has a data rate of 1 Mbps. The Exchange of 1000 bits is required for the set up and teardown phases. The distance between two parts is 5000 km.

Sub: _____

Day

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|--|--|--|--|--|--|--|--|
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|--|--|--|--|--|--|--|--|

Time: _____

Date: / /

03

a) List five types of topology in computer networks? — 5

b) Differentiate between terrestrial and satellite microwave transmission system? — 5

c) What do you mean by geostationary satellite system? — 4

04

a) What are the differences between circuit switching and packet switching? — 5

b) List four types of connections in a network — 5

c) What is direct control switching system? — 5

05

a) Define electromechanical system? and describe benefits of an automatic switching system. — 5

b) Define circuit switching? what are the benefits of circuit switching? — 5

c) What are the features of crossbar switches? — 4

06

- a) Define satellite microwave transmission system? — 5
- b) Write down advantages and disadvantages of star topology? — 4
- c) Define public switched telephone network? — 4

07

- a) What do you mean by IT support skills or network engineering? — 4
- b) What is Hybrid topology? — 5
- c) List the advantages and disadvantages of ISDN? — 5

08

- a) Distinguish between cable modem and ADSL? — 2
- b) Write short notes : (any four) 12
- i) Out band signaling
 - ii) Ring topology
 - iii) Bus topology
 - iv) Electronic mail
 - v) LAN

Sub: _____

Day

Time: _____

Date: / /

Ans: to the ques: NO:- 01 (a)

a) Dial-up modem technology:- Dial up modems use part of the bandwidth of the local loop to transfer data.

Common-modem standards:-

The latest dial-up modems use the V series standards such as V.32 - and V.32 bits (9600bps) V.34 bits (28,800 or 33600 bps) V.90 (56 Kbps for down) loading and 33.6 Kbps for uploading) and V.92 (56 Kbps for downloading and 48 Kbps for uploading)

Ans: to the ques: NO:- 01 (b)

b) 1) Describe the electrical output of the sensor or selection preceding the gain block.

2) Calculate the ADC's requirements

3) Find the optional ADC + voltage reference the signal conversion.

4) Find the maximum gain and define search criteria for the op-amp.

Sub: _____

Day

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|--|--|--|--|--|--|--|--|
| | | | | | | | |
|--|--|--|--|--|--|--|--|

Time

Date: / /

- 5) Find the optional amplifier and design the gain block.
- 6) Check the total solution noise against the design target
- 7) Run solution and validate.

Ans. to the ques: No:- 01 (c)

c) PBX:- Private Branch Exchange is a telephone system within a local area that switches calls between these users on local lines while allowing all users to share a certain number of external phone lines.

The parts of a PBX include:-

- ★ A telephone trunk that contains many phone lines, which are terminated at PBX.
- ★ The network of lines within the PBX
- ★ A human operator console which is optional.

Sub: _____

Day

Time: _____

Date: / /

Ans: to the ques: No: 02(a)

a) Blocking:- In multistage switching blocking refers to times when one input can't be connected to an output because there is no path available between them all the possible intermediate switches are occupied. One solution to blocking is to increase the number of intermediate switches.

TSI (Time-Slot Interchanges) is the most popular technology in a time division switch. It used random access memory with several memory locations. The RAM fills up with increase data from time slots in the order received slots are then sent out in an order based on the decisions of a control unit.

Ans. to the ques: No:- 02 (b)

5)

① $78 + 25 + 1 = 104 \text{ ms}$

④ $78 + 25 + 100 = 203 \text{ ms}$

(ii) $78 + 25 + 1000 = 1109 \text{ ms}$
 (iii) $78 + 25 + 1000 = 1109 \text{ ms}$ we have

(iii) $78 + 25 + 1000 = 1103$ ms we have 104 ms

(iv) In case a we have $203/100 = 2.03 \text{ ms}$
b we have $203/100 = 1.103 \text{ ms}$

In case b we have $1109/1000 = 1.109 \text{ ms}$

In case c we

Sub: _____

Day _____

Time: _____

Date: / /

Ans: to the ques: No:- 03 (a)

a) There are five types of topology in computer networks.

① Mesh topology

② Star topology

③ Bus topology

④ Ring topology

⑤ Hybrid topology

Ans: to the ques: No:- 03 (b)

| Terrestrial microwave | Satellite microwave |
|---|------------------------|
| 1) The frequency range needed is from 4 GHz to 6 GHz | 1) 11 GHz to 14 GHz |
| 2) In this system attenuation mostly depends on frequency and signal strength | 2) Frequency and power |

Sub: _____

Day _____

Time: _____

Date: / /

Terrestrial microwave

3) Requires focused signals and line of sight as physical path.

4) Relay + towers are used to extend the signals

Satellite microwave

3) Requires the proper allignment of earth station attends,

4) Satellites are used for the expansion of signal

Ans. to the ques: No:- 03 (c)

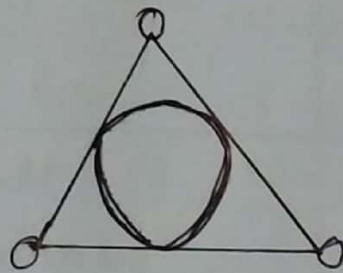


Fig:- Geostationary satellite

The satellite were placed in low earth orbit as a result the satellite at a such high speed that it visible to the ground only for a short time at each day, the satellite appeared below the horizon and then appear

Sub: _____

Day

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|--|--|--|--|--|--|--|--|
| | | | | | | | |
|--|--|--|--|--|--|--|--|

Time: _____

Date: / /

below the opposite horizon the ground station was cut-off or long time in a day to maintain the communication link another station had to be activated.



Sub: _____

Day _____

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|--|--|--|--|--|--|--|--|--|--|
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|--|--|--|--|--|--|--|--|--|--|

Time: _____

Date: / /

Ans: to the ques: No- 04 (a)

a)

| Feature | Switch Circuit | Packet switching |
|------------------|-------------------------------------|--|
| Dedicated path | Yes | No |
| Path info | Path dedicated for one conversation | Route is established on a per packet basis of the conversation using datagram. |
| Delay | Call setup delay | packet transmission delay |
| Bandwidth type | fixed bandwidth | Dynamic |
| overload effects | stops call establishment | Increase packet delay |

Sub: _____

Day

| | | | | | | | |
|--|--|--|--|--|--|--|--|
| | | | | | | | |
|--|--|--|--|--|--|--|--|

Time: _____

Date: / /

Ans: to the ques: No:- 04 (b)

There are four types of connections that can be established in a telecommunications Network.

★ Local call connection between subscriber 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.

Sub: _____

Day _____

Time: _____

Date: / /

Ans: to the ques: No:- 04 (c)

(c) Direct Control switching system:-

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

Benefits of automatic switching system:-

- Language barriers will not affect the request for connection.
- Higher degree of privacy is maintained.
- Faster established and release of call is done.
- Number of calls made in a given period can be increased.
- Calls can be made irrespective of the load on the system ~~at~~ or the time of the day.

Sub: _____

Day

Time: _____

Date: / /

Ans: to the ques: No:- 05 (a)

Electromechanical crosspoint technology

The electromechanical crosspoint 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.

The challenges are described below:-

- ① Reduction in the size of a crosspoint
- ② Reduction in the cost of a crosspoint
- ③ Improvisation of the switching time
- ④ Electromechanical
- ⑤ Electronics

Sub: _____

Day _____

Time: _____

Date: / /

Ans: to the ques: No:- 05 (b)

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

Benefits of circuit switching:-

- ① It uses a fixed bandwidth.
- ② Data is transmitted with a fixed data rate.
- ③ No waiting time in switches.
- ④ Suitable for long & continuous communication.

Ans: to the ques: No:- 05 (c)

c) Features of crossbar switches:

- ① While processing a call the common control system helps in the sharing of resources.
- ② The specific route functions of call processing are ~~hardwired~~ hardwired because of the wire logic computers.

Sub: _____

Day

Time: _____

Date: / /

iii) The flexible system design helps in the appropriate station selection is allowed for a specific switch.

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

Ans. to the ques. No:- 06 (a)

a) Satellite microwave transmission system uses satellites for broadcasting and receiving of signals. These systems need satellite which are in the geostationary orbit which is 3600km above the earth.

Describe of satellite communication:-

(i) The transmitter and receiver used in satellite communication high requires high power, most sensitive transmitters and large diameters antenna.

(ii) Satellite communication is disturbed by solar activities and cyclone in the space.

Sub: _____

Day

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|--|--|--|--|--|--|--|--|
| | | | | | | | |
|--|--|--|--|--|--|--|--|

Time: _____

Date: / /

- iii) Due to ageing effect the efficiency of satellite components decreases.
- iv) The larger propagation times is one of a disadvantage of satellite.
- v) The cost for initial design and launching of the satellite in the orbit results is extremely high.

Ans: to the ques No:- 06 (b)

b) Advantage of star topology:-

- i) Less expensive
- ii) Easier to install
- iii) Less amount of cable
- iv) Robust, if one line fails other lines will work just fine.
- v) Easy fault detection because the link can easily identified.

Sub: _____

Day

Time: _____

Date: / /

Disadvantage of star topology:-

- ① If hub goes down everything goes down
- ② Hub requires more resources and regular maintenance because it is the control system of star topology.

Ans: to the ques: No:- 06 (c)

- ① PSTN: Public Switched Telephone Network is perhaps the most ~~stud~~ stupendous (विशाल) telecommunication network in existing today.

Any telecommunication network may be viewed as consisting of the following major systems:-

- ① Subscriber and instruments
- ② Subscriber loop system
- ③ Switching systems
- ④ Transmission systems
- ⑤ Signaling systems.

Sub: _____

Day

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|--|--|--|--|--|--|--|--|
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|--|--|--|--|--|--|--|--|

Time: _____

Date: / /

Ans: to the ques: NO:- 07 (a)

a) Network engineering involves different types of process which are required to monitor support, troubleshoot and implement communication networks. This could either be within a single organization or multiple organizations. Skilled network supports engineers are expected to be able to create a network infrastructure should be available to variety of stakeholders which helps customers, employees, suppliers, side staff, client.

They are also expected to have relevant knowledge regarding different types of network such as WAN, LAN, MAN, WLAN etc.

Ans: to the ques: No: 07(b)

b) Hybrid Technology:- A combination of two or more topology is known as Hybrid technology.

Advantages of hybrid technology:-

1) We have can choose the topology based on the requirement for example scalability is our concern then we can use star topology instead of bus topology.

2) Scalable as we can further connect other computer network with the existing networks with different topologies:-

Disadvantage of Hybrid topology:-

i) Fault detection is different

ii) Installation is difficult.

iii) Design is complex so maintenance is high thus expensive

iv)

Ans: to the ques: no. 07 (c)

Advantages of ISDN:

- i) As the services are digital, there is less chance for error.
- ii) The connection is faster.
- iii) The bandwidth is higher.
- iv) Voice, data and video all of these can be sent over a single ISDN line.

Disadvantage of ISDN:-

The disadvantages of ISDN is that it requires specified digital services and is ~~costlier~~ costlier. However the advent of ISDN has brought advancement in communication multiple transmission with greater speed, are being achieved with higher level of accuracy.

Sub: _____

Day

Time: _____

Date: / /

Ans: to the ques: No:- 08 (a)

a) CM vs CMTS:-

- ① The CM is installed on the subscriber premises. The CMTS is installed inside the distribution hub by the cable company.
- ② The CM receives data from the internet and passes them to the combiner which sends them to the subscriber. The CMTS also receives data from the subscriber and passes them to the internet.
- 3) Advantage of ISDN:-
 - i) As the services are digital, there is less chance for errors.
 - ii) The connection is faster.
 - iii) The bandwidth is higher.
 - iv) Voice, data and video all of these can be sent over a single ISDN line.

Sub: _____

Day

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|--|--|--|--|--|--|--|--|--|--|

Time: _____

Date: / /

Disadvantage of ISDN

The disadvantage of ISDN is that it requires specified digital services and is costlier. However the advent of ISDN has brought advancement in communications. Multiple transmission with greater speed are being achieved with higher levels of accuracy.

Ans: to the ques: No. 08 (b)

Hybrid Topology: - A combination of two or more topology is known as hybrid topology.

Advantage of hybrid topology: -

1) We can choose the topology based on the requirement for example scalability is our concern then we use star topology instead of bus topology.

Sub: _____

Day

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|--|--|--|--|--|--|--|--|--|--|

Time: _____

Date: / /

② Scalable as we can further connect other computer network with the existing networks with different topologies.

Disadvantage of hybrid topology:-

- i) Fault detection is different.
- ii) Installation is difficult.
- iii) Design is complex so maintenance is high thus expensive.