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1.

a) List five types topology in computer network.

Describe the pitfalls of mesh topology. -5

b) Differentiate between terrestrial microwave and satellite microwave transmission system. -5

c) What do you mean by Geostationary satellite system. Describe briefly. -4

2.

a) What are the disadvantages of message switching. -5

b) Define dial tone. List five subscriber related signal function that are to be performed by the operator. -6

c) What switching method reduces traffic congestion. -3

3.

a) Write some example of telecommunication technologies. -3

b) Write the some skills that needed for telecommunication. -3

c) Explain the feature of telecommunication technologies. -7

4.

- a) Define satellite microwave transmission system. Describe the demerits of satellite communication. - 5
- b) Write the advantages and disadvantages of star topology. - 5
- c) Define public switched telephone network. List major systems of any telecommunication network. - 9

5.

- a) Define satellite communication. Draw the block diagram of satellite communication. - 5
- b) Write the advantages of satellite communication. - 5
- c) Write down the characteristics of mesh topology. - 9

6.

- a) How is data transfer achieved using CATV channel.
- b) Write down short notes :

- i) POTS
- ii) PBX
- iii) In channel signalling
- iv) charging plan.

(Q1 : on notes up till of ENA)

7.

- a) Define In-band signaling. Write down advantages of In-band signaling. - 4
- b) How many types of signaling techniques? Draw the diagram of signaling technique. - 6
- c) Define DSL. Write the service provided by the telephone companies using DSL. - 9

8.

- a) What is LATA. Explain Intra-LATA and inter-LATA. - 3
- b) How to use rotary dial for implementing pulse dialing? - 5
- c) What are the determining design of a switching system. - 6

Ans. to the question no: 1(a)

There are five types of topology in computer network:

1. Mesh topology.
2. Star topology.
3. Bus topology.
4. Ring topology.
5. Hybrid topology.

Pitfalls of Mesh topology:

1. Amount of wires required to connect each system is tedious and headache.
2. Stability issues because a device can't be connected with large number of device with a dedicated point link.

1.(b) Differentiate between terrestrial and satellite microwave transmission system.

~~Ans. to the question no - 1(b)~~

~~Ans. to the question no - 1(b)~~

Terrestrial	Microwave	Satellite	Microwave
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1. The frequency range needed is from 4 GHz to 6 GHz.

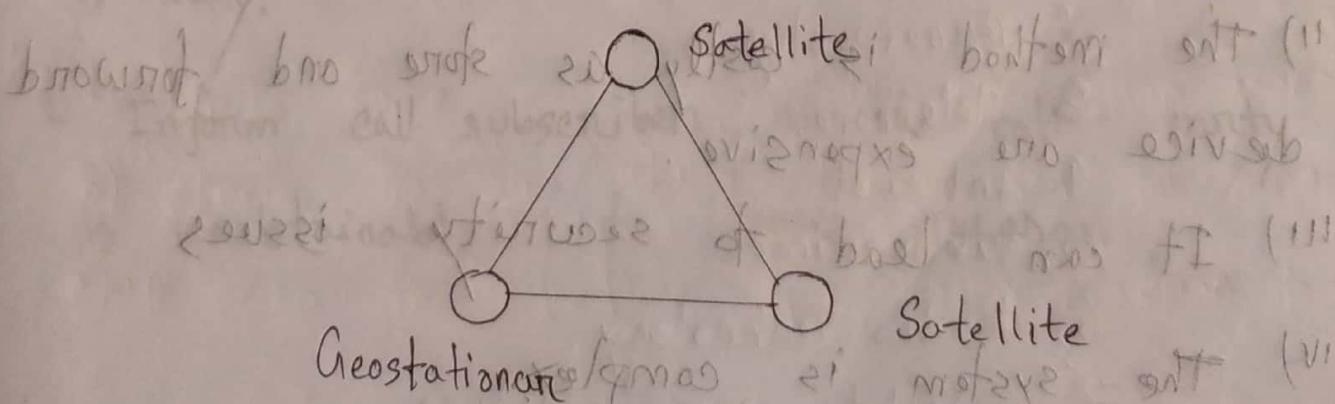
2. In this system, attenuation mainly depends on frequency and signal strength.

3. It requires fixed signal and line of sight physical path.

1. The frequency range needed between 12 GHz to 14 GHz.

2. Attenuation is generally affected by frequency and power.

3. It requires the proper alignment of earth station antennas.



Geostationary Satellite:

The satellite was placed in low earth orbit.

As a result of the satellite at a such high speed that is visible to the ground only for a short time. At each day, the satellite operated below the horizon and disappears below the opposite horizon.

Q. 2 (a) What are the disadvantages of message switching?

Ans. to the question no. 2 (a)

The disadvantages are given below:

- i) This switching types is not compatible for interactive applications such as voice and video.

- ii) The method is costly as store and forward device are expensive.

- iii) It can lead to security issues.

- iv) The system is complex.

2. b) Define dial tone. List five subscribers signaling function that are to be performed.

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Ans to the question no : 2(b)

Dial tone : The dial tone is signaling tone, which include that the exchange is ready to accept the dial digit.

Responds to the calling subscriber that the call is being established.

ii. Inform the calling subscriber that the system is ready.

iii. Ring the bell to the call party.

iv. Inform the calling subscriber if the call party is busy.

v. Inform call subscriber, if the call party line is unobtainable for some reason.

c) Which switching method reduces traffic congestion.

Ans. to the question no : 2(c)

Congestion is a system symptom 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.

3(a) Write some examples of telecommunication technology.

Ans. to the question no : 3(a)

1. Television
2. Broadcasting
3. Telephone
4. Internet
5. Cyber crime
6. Radio technology
7. Satellite communication

3.(b) Write some skills that are needed in telecommunication.

Ans. to the question : 3(b)

Here are the top telecommunication skills which are required to help you meet industry demand.

* Cloud computing skills

* IT support skills.

* Programming

* Soft skills

* Value adding and certification

3.(c) Explain the future of telecommunications Engineering

Ans. to the question : 3(c)

Terminals and channel :

All telecommunication network depends on terminal. They are components that allow communications to stop and start. There's no point in having a term without having a channel to support it.

Telecommunication processor:

As you may already be aware, the information that passes through channels require a lot of processing before it reaches the end user.

Telecommunication software:

The information that passes through different telecommunication channel needs software to support it too. The type of software you use will depend on your telecommunication of choice.

9.(a) Define satellite microwave transmission system.

Describe the demerits of satellite transmission.

Ans. to the question no : 9(a)

Satellite microwave transmission system uses satellite for broad broadcasting and receiving of signals.

These system needs satellite which are in the orbit which is 3600 km above the ~~ear~~ earth.

Demerits of satellite communication:

1. Satellite communication is disturbed by solar activity and cyclones in the space.
2. Due to aging effect the efficiency of satellite components decreases.
3. The longer propagation times is one of disadvantage of satellite communication.

4. (b) Write the advantages and disadvantages of star topology.

Ans. to the question no: 4 (b)

Advantages :

1. Less expensive because each device only need one I/O port.
2. Easier to install.
3. Less amount of cables required.
4. Robust, if one link falls other link will work just fine.
5. Easy fault detection.

Disadvantages :

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

4. (c) Define public switched telephone system. List major systems of any telecommunication network.

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Ans. to the question no : 4(c)

PSTN : Public switched telephone network is perhaps the most stupendous telecommunication network in existence today. The length of telephone wire-pairs buried underground exceeds.

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

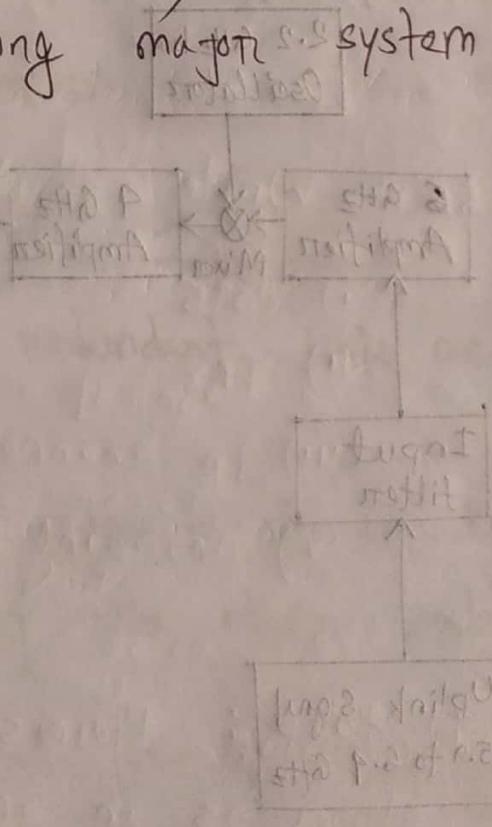
1. Subscriber and instrument

2. Subscriber loop system

3. Switching system.

4. Transmission system.

5. Signaling system.

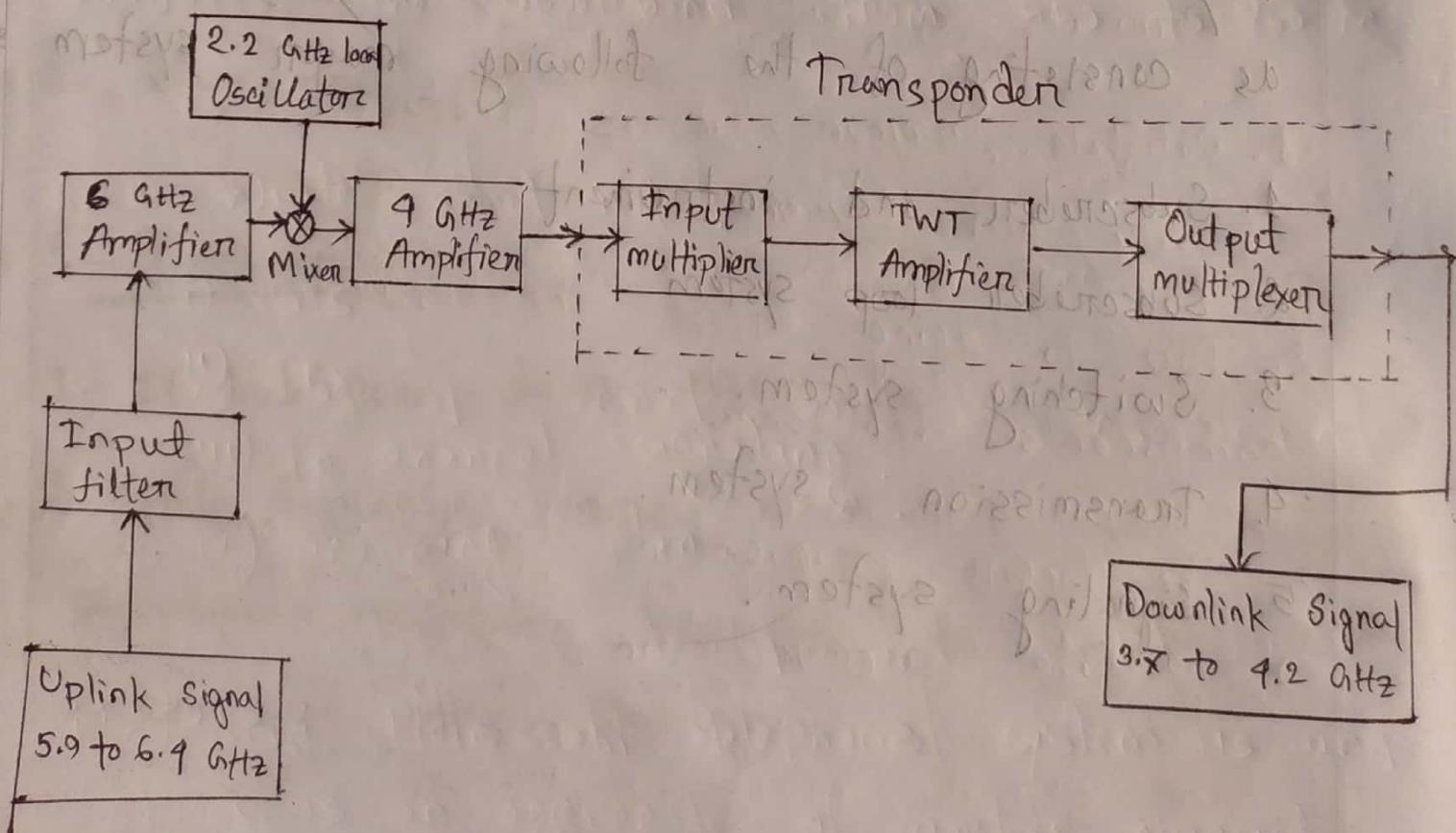


5. a) Define satellite communication. Draw the block diagram of satellite communication system.

Ans. to the question no : 5(a)

Satellite communication : Satellite is powerful long distance and point to multipoint communication system. A communication satellite is on Radio's frequency repeater.

Block diagram of satellite communication system:



5.(b) Write down the merit of satellite communication.

(e) Ans. to the question no : 5(b)

1. No tracking is required by Geostationary satellite.
 2. Multiple access point are available in satellite communication.
 3. 24 hour communication can be achieved with the help of satellite.
 4. The signal quality of satellite communication is higher.
 5. To put more information on the channel a broadband user can use.
5. (c) Write down the characteristics of a Mesh topology.

Ans. to the question no : 5(c)

- * A mesh topology provides redundant link access to the network.
- * If a break occurs in a segment of a cable, traffic can still be regulated using the other cable.
- * It is common to partial mesh topology to be used to balance cost and the need for redundancy.

Q. a) How is data transfer achieved by using CATV channel.

Ans. to the question no : 6(a)

To provide internet access, the cable company has divided the available bandwidth of the coaxial cable into three bands; video, downstream data and upstream data. The downstream only video band occupies frequency from 54 to 550 MHz. The downstream data occupies the upperband from 550 to 750 MHz.

b. (b) Write short note:

i) POTS

ii) PBX

iii) In channel signaling.

iv) Charging plan.

i) POTS: Plain old telephone system is understood as an aggregate of world's circuit switched telephone network, used for

providing public telecommunication. These systems are operated regionally locally and internationally using telephone networks.

i) PBX: PBX can be understood as a local exchange within themselves. As the name implies, it is a private exchange which is a branch to the main exchange to the similar local loop connected to the main loop.

ii) Charging plan: The calls are charged as accounted by the metering instruments connected to each subscriber line on as per a metering register that is assigned to each subscriber.

iii) Closed numbering plan: This is also called the uniform numbering plan where the number of digits in a subscriber number are fixed. This is used in a few countries such as France, Belgium, Canada and the USA.

7. a) Define In-band signaling. Write down the advantages of In-band signaling.

Ans. to the question no: 7(a)

In-band signaling: In-band voice frequency uses the same frequency band as the voice, which is 300-3400 Hz. which has to be protected against false operation by speech.

Advantage of In-band signaling:

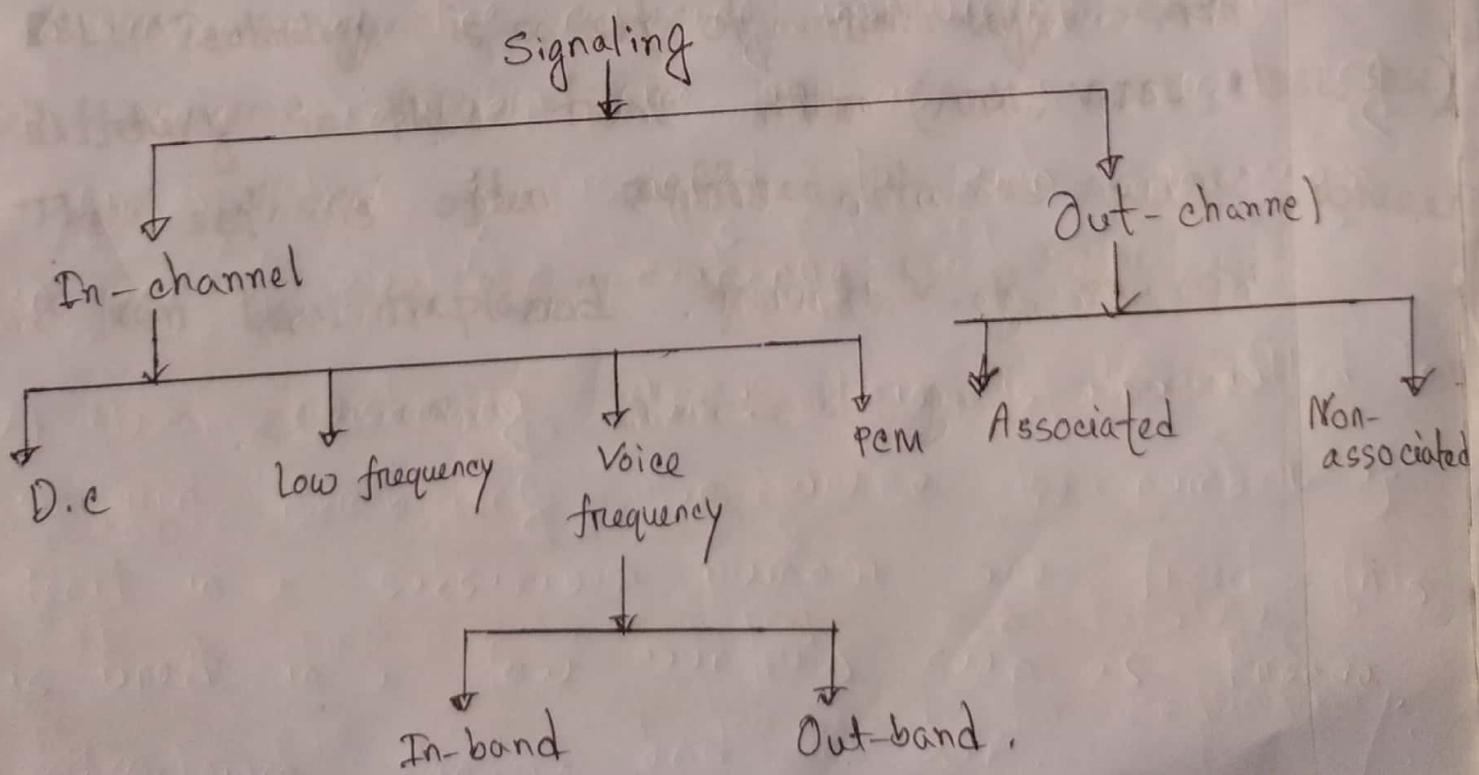
- * The central signal can be sent to every part where a speech signal can be reach.
- * The control signals will be independent of the transmission system.
- * The analog to digital and digital to analog conversion processes will not affect them.

7. b) How many types of signaling techniques ? Draw the diagram of signaling technique.

Ans. to the question no: 7(b)

As discussed above, the signaling techniques are categorized into two, the In-channel signaling and the common channel signaling.

Diagram of signaling techniques :



7. c) What is DSL Technology? What are the service provided by the telephone companies using DSL?

Ans. to the question no: 7(c)

DSL: Telephone company developed digital subscriber line technology to provide higher speed access to internet.

Service provided: by the telephone companies using DSL.

DSL Technology is a set of technology each differing in the first letter (ADSL, VDSL, HDSL, SDSL). They are often referred to as \times DSL, where \times can be replaced by A, V, H or S.

8. a) What is LATA ? What are Intra-LATA and Inter-LATA service ?

Ans. to the question no : 8(a)

(a) ~~from naifep / off~~
LATA : A LATA is small or large metropolitan area that according to the divestiture of 1984 was under the control of a single telephone service provider of ~~area~~

Inter-LATA and Intra-LATA : ~~browsing services~~

The service offered by the common carriers inside a LATA area called Inter-LATA service. The service between LATA's area handled by inter-exchange carriers. This carriers, ~~are~~ sometimes called long-distance companies.

8. b) How to use a rotary dial phone for implementing pulse dialing?

: Ans. to the question no : 8(b)

- * finger, plate and spring from set against
- * Shaft, gear and pinion wheel. and set to
- * Pawl and ratchet mechanism.
- * Impulsing contact.
- * Centrifugal governor and worm gear.
- * Transmitter, receiver and bell by pass circuits.

8. c) What are the determining the design of a

switching system?

Ans. to the question no : 8(c)

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 the calling rate + the average holding time during the 60 minutes period.

Calling rate:

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

Holding time:

This is the mean amount time that a call last.

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