

MAWLANA BHASANI SCIENCE AND TECHNOLOGY UNIVERSITY

DEPARTMENT OF ICT

Assignment(CT) No: 02

Course code : Telecommunication Engineering

Assignment (CT) name : Telephone Network

Submitted by

Hafizul Islam

ID: IT-17034

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Submitted to  
Nazrul Islam

Assistant professor

Department of ICT, MBSTU

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Santosh, Tangail - 1902

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Questions:

01. (a) Write the some of skills are needed for telecommunication → 4

(b) What are some examples of telecommunication technologies?

(c) Explain the features of telecommunication engineering → 3

02. (a) Define the satellite communication. Draw the block diagram of satellite communication. → 7

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

(c) Write down characteristics of mesh topology. → 5

03. (a) List five types of topology in computer networks.

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?

04. (a) What is LATA? What are intra-LATA and inter LATA services? → 4

(b) How to use a rotary dialphone for implementing pulse dialing? → 5

(c) What are the determining the design of a switching system? → 6

05. ① What are the disadvantages of message switching? → 5  
② What is dial tone? List five subscriber related signaling functions that are to be performed by the operators. → 6  
③ Which switching method reduces traffic congestion?

06. ① Define satellite microwave transmission system. Describe the merits of satellite communication. → 5  
② Write down advantages & disadvantages of star topology. → 5  
③ Define public switched telephone network (PSTN). List major systems of any telecommunication network.

07. ① What do you mean by In-band signaling? Write down advantage of In-band signaling. → 4  
② How many types of signaling techniques? Draw the diagram of signaling techniques. → 4  
③ What is DSL technology? What are the services provided by the telephone companies using DSL? Distinguish between a DSL modem and a DSLAM. → 4

P8. a) How is data transfer achieved using CATV channels?  
→ 2

- b) Write short notes (any four):
- i. POTS (Plain Old Telephone System)
  - ii. closed numbering plan.
  - iii. charging plan
  - iv. PBX (Private Branch Exchange)
  - v. In-channel Signaling

Q1. (a) Write the some of skills are needed for telecommunication.

Ans. to the Question no- 01(a)

Hence are the top telecommunication skills which are required to help you meet industry demands.

- Cloud computing skills.
- IT Support skills for Network Engineering
- Programming
- Soft skills
- Value adding and certification

Q1. (b) What are some examples of telecommunication technologies?

Ans. to the Question no- 01(b)

Examples of telecommunication technology

- o Television
- o Broadcasting
- o Telephone
- o Internet
- o Cybercrime
- o Radio technology
- o Satellite communication
- o Modem

01.(C) Explain the features of telecommunication engineering

Ans. to the Ques. No-01(C)

Features of telecommunication engineering:

Terminals and channels:

All telecommunications network depend on terminals.

They are the components that allow communications to stop and start. There's no point in having a terminal without having a channel to support it. The best example of modern channel is the wireless signal.

Telecommunications processors:

As you may already be aware, the information that passes through channels requires a lot of processing before it reaches the end user. In a lot of cases, this means moving from analog to digital and then back to analog again.

## Telecommunications Software:

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

## The types of Data Being Submitted:

As we've already highlighted, telecommunications come in lots of wonderful formats now. Although voice conversations will continue to reign supreme for a while, many business rely on instant message.

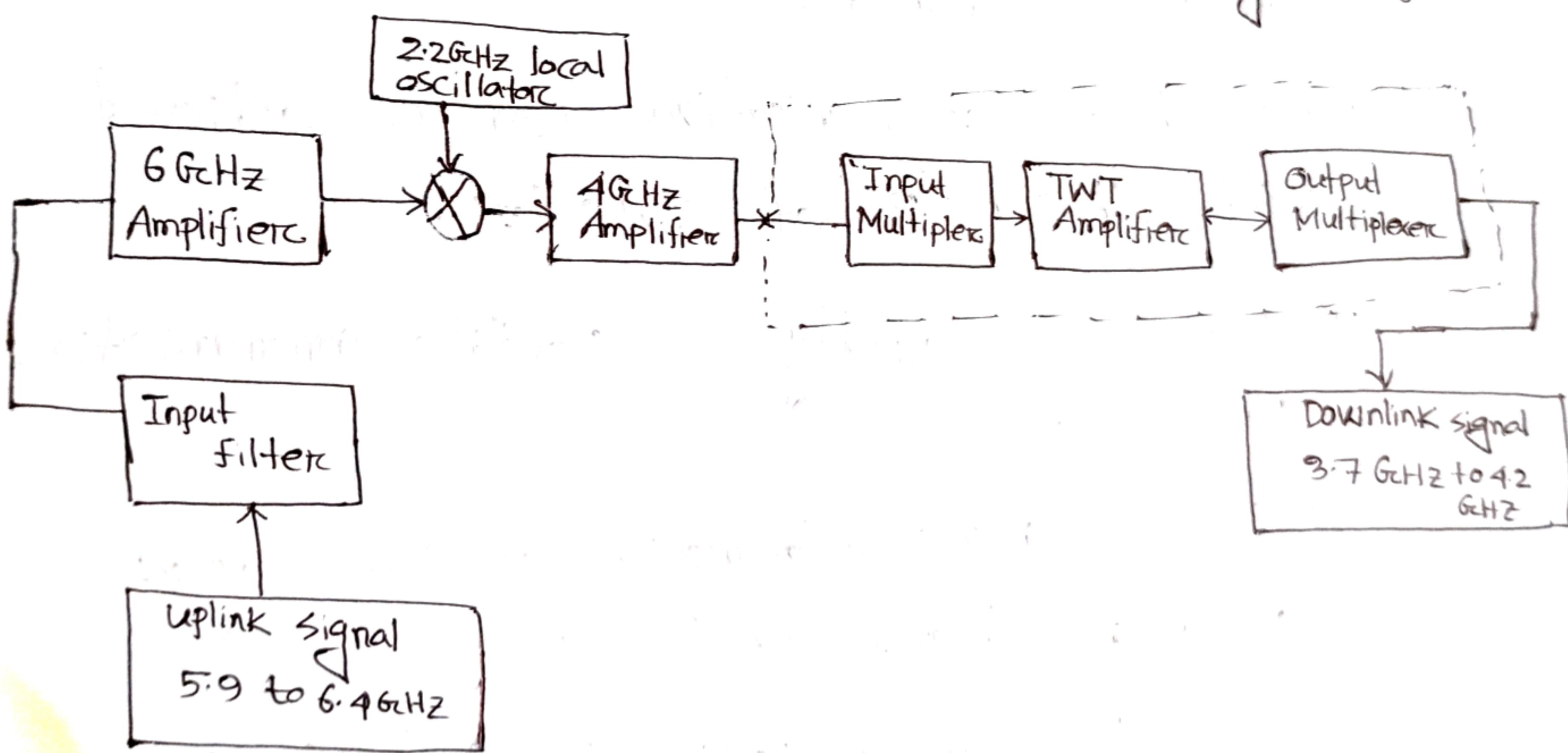
Q2. (a) Define Satellite Communication. Draw the block diagram of Satellite Communication System.

Aim to the Ques No-2(a)

### Satellite Communication:

Satellite is powerful long distance and point to multipoint communication system. A communication satellite is an radio frequency repeater.

Block diagram of Satellite Communication system.



Q2. (b) Write down the merits of the Satellite Communication.

Following

Merits:

Ans. to the Ques. No- 02(b)

is the merits of satellite communication system

1. No tracking is required by Geostationary Satellites.
2. Multiple access points 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 satellites a broad band can be used.
6. Satellite Communication is used for long distance communication or across oceans.

Q2.(c) Write down characteristics of a mesh topology.

Ans. to the Ques. No-02(c)

Characteristics of a mesh topology are as follows:

- A mesh topology provides redundant links across the network.
- If a break occurs in a segment of cable, traffic can still be rerouted using the other cables.
- This topology is rarely used because of the significant cost and work involved in having network components directly connected to every other component.
- It is common for partial mesh topologies to be deployed. This balances cost and the need for redundancy.

Q3. (a) List five types of topology in Computer network.  
Describe the pitfalls of mesh topology.

Ans. to the Ques. No 03(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. Since each device needs to be connected with other devices, number of I/O ports required must be huge.

3. Scalability issues because a device cannot be connected with large number of device with a dedicated point to point link.

Q3. (b) Differentiate between Terrestrial Microwave and Satellite Microwave Transmission System

Ans. to the Ques. No - 03(b)

### Terrestrial Microwave

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

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

3. It requires focused signals and line of sight on physical path.

4. In these systems, short distance systems can be expected but long distance systems are almost costly.

5. Relay towers are used to exactly extend the signals.

### Satellite Microwave

1. The frequency range used in this system is between 11 GHz to 14GHz.

2. Attenuation is generally affected by the frequency and power.

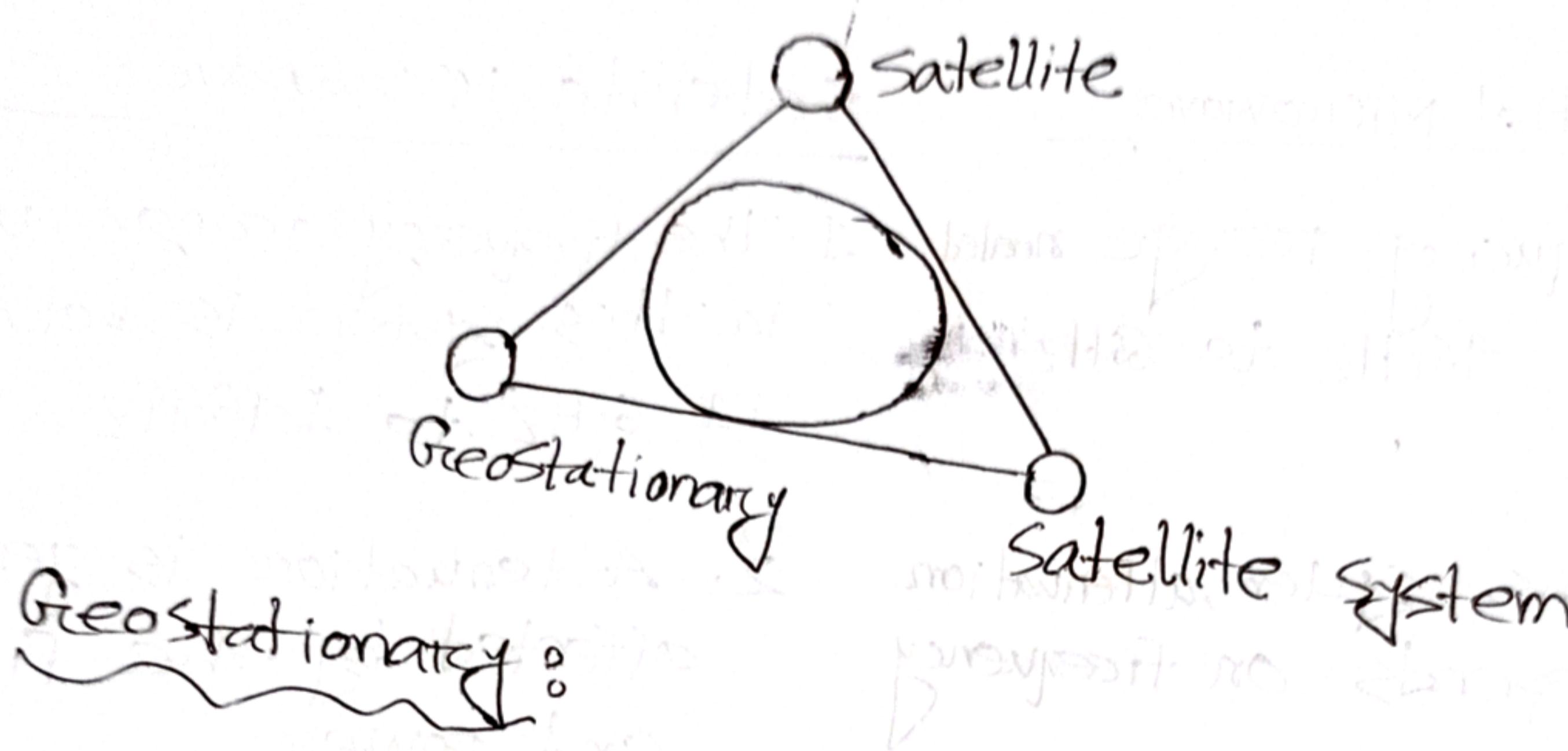
3. It requires the proper alignment of earth station antennas.

4. These systems are very expensive on cost of building and launching is very high.

5. Satellites are used for expanding of signals.

Q3. (c) What do you mean by Geostationary Satellite System?

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



The satellites were placed in low earth orbit. As a result the satellite at a such high speed that if visible to the ground only for a short time at each day, the satellite appeared below the horizon, the ground station was cut-off or long time in a day, to maintain the communication link another station had to be activated.

04.(a) What is LATA? What are intra-LATA and inter-LATA services?

Ans. to the que. No-04(a)

LATA:

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.

Intra-LATA and Inter-LATA services:

The services offered by common carriers inside a LATA area called intra-LATA services. The services between LATAs are handled by interexchange carriers (IXCs). These carriers sometimes called long-distance companies, provide communication services between two customers in different LATAS.

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

Ans. to the Ques. No- 04(b)

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

- i. Finger plate and spring.
- ii. Shaft, gears and pinion wheel
- iii. Pawl and ratchet mechanism
- iv. Impulsing contact
- v. Impulsing cam and successors cam or a triggers mechanism.
- vi. Centrifugal governor and worm gear.
- vii. Transmitter, receiver and bell by pass circuits.

Q5.(a) What are the disadvantages of message switching?

Ans. to the Ques. No - 5(a)

Following

are the disadvantages of message switching type:

- i. This switching type is not compatible for interactive applications 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.

Q5.(b) What is dial tone? List five subscriber related signaling functions that are to be performed by the operators.

Ans. to the Ques. No - 05(b)

Dial tone:

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

- i. Respond to the calling subscribers that system is ready to receive the identification of the called party.
- ii. Inform the calling subscribers that the call is being established.
- iii. Ring the bell of the called party.
- iv. Inform the calling subscribers if the called party is busy.
- v. Inform the calling subscribers, if the called party line is unobtainable for some reason.

Q5. (c) Which switching method reduces traffic congestion?

Ans. to the Ques. No - 05(c)

Congestion is a 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.