**SC**

**Assignment-1**

1. Explain Satellite as a communication media and draw block diagram of Satellite Communication.
2. List different advantages and applications of Satellite Communication.
3. Explain Kepler’s three laws with their importance in Satellite Communication.
4. State and explain the areas in which satellite communication is best suited over optical communication systems
5. Define followings
   * 1. Ascending Node (ii) Descending Node (iii) Inclination (iv) Argument of Perigee.(v) Apogee (vi) True anomaly (vii) Mean anomaly (vii) Retrograde orbit
6. Distinguish between geostationary and Geosynchronous Orbit.
7. Describe briefly the main advantages of satellite communication and discuss the applications of satellite communication.
8. What is satellite communication?
9. List the orbital elements and explain each of them in detail. Also give their significance in orbital maintenance. .

**Assignment-2**

1. What are the different factor that affects the orbiting path and attitude? Elaborate the methods of station keeping.
2. Draw Block diagram of Satellite Control system.
3. What is the purpose of Telemetry, Tracking, Command, and Monitoring in Satellite communication? Explain in detail.
4. List various types of control required to maintain the satellite in space and distinguish attitude and orbital control system in detail.
5. Explain elevation angle and azimuth angle calculation with proper derivations.
6. Explain the difference between Attitude Control and Orbital control.
7. List various types of control required to maintain the satellite in space and explain attitude and orbital control system in detail.
8. Give all the steps to launch the satellite vehicles for geostationary orbits and explain it with required figure
9. Determine the link power budget calculation is done in satellite communication system.
10. Explain DBS –TV uplink earth station with necessary block diagram.

**Unit-3**

1. Derive [C/No] for downlink of satellite. Explain output back –off and its effect on downlink design. **(12.6 and 12.7 of Dennis and Roddy)**
2. Explain in detail with proper examples various types of losses found in satellite communication system.
3. Explain how to compute uplink and downlink C/N ratios for a typical satellite link. **(12.8 of Dennis and Roddy)**
4. Write a note on Cross-Polarization discrimination. **(5.4 of Dennis and Roddy)**
5. List the types of propagation effect that can provide impact on satellite – earth link and explain any two of them. **(4.1 to 4.5of Dennis and Roddy)**
6. An earth station have equivalent noise temperature of 2000 K, noise bandwidth of 18 MHz, antenna gain of 50dB and carrier frequency of 12 GHz Determine gain to equivalent noise temperature ratio, Noise density and total noise power.
7. Explain what is meant by equivalent isotropic radiated power. A satellite downlink at 10 GHz operates with a transmit power of 10W and an antenna gain of 50 dB. Determine the EIRP in dBW.
8. A satellite link operating at 16 GHz has receiver feeder losses of 1.5dB and a free loss of 207dB. The atmospheric absorption loss is 0.5dB and the antenna pointing loss is 0.5dB. Depolarization losses may be neglected. Calculate the total link loss for clear sky condition.

**All the examples of chapter 4**

**Unit-4**

**(Chapter-14, HDTV- 16.13, VSAT- 17.3, GPS-17.5 from Dennis and Roddy)**

1. What is Satellite Access? Define Single access and multiple accesses as applied to satellite works. What is need for multiple accesses? Distinguish between Multiplexing and Multiple Access.
2. List the types of multiple access systems used in satellite Communication and give its comparison.
3. Differentiate among TDMA, FDMA and CDMA systems. **(14.7,14.3 and 14.10 of Dennis and Roddy)**
4. Explain principle of GPS position location. Also explain signal generation in GPS.

**FDMA**

1. Explain what is meant by frequency-division multiple accesses, and show how this differs from frequency-division multiplexing.
2. Compare Preassigned FDMA and demand assigned FDMA.

**VSAT**

1. Write short notes on Access Control Protocols used in VSAT network.
2. What is VSAT? List the application of VSAT. Also draw and explain the architecture of VSAT system.