Roll No. ..... Total Pages : 03

BT-7/D-18 37139

SATELLITE COMMUNICATION

ECE-423N

Time : Three Hours] [Maximum Marks : 75

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit.

Unit I

1. Explain the terms with proper diagrams where required :
   (a) Inclination (b) Apogee
   (c) Perigee (d) Subsatellite path. **15**

2. (a) Determine the angle of tilt required for a polarmount used with an earth station at latitude 54°N. Assume spherical earth of mean radius 6371 km and ignore earth station altitude. **5**
   (b) State and explain with necessary diagrams and equations, Kepler's three laws of motion. **10**

Unit II

3. (a) Briefly describe three axes method of satellite stabilization. Also define the terms roll, pitch and yaw. **10**

(b) Write a short note on the basic antennas which are used with commuication satellites. 5

4. (a) Briefly explain TTC and M subsystems. 7.5

(b) What are communication subsystem ? Discuss in brief with diagrams. 7.5

Unit III

5. (a) Derive the system noise temperature (Ts) for amplifiers connected in series. 7.5

(b) A satellite downlink at 12 GHz operates with a transmit power of 6 watts and atenna gain of 48.2 dB. Calculate EIRP in dBW. 7.5

6. (a) Explain different types of transmission losses in satellite link. 7.5

(b) Discuss how attenuation is affected in the presence of rain. 7.5

Unit IV

7. (a) Describe the general operating principles of TDMA system and also explain the different components of reference burst in TDMA system. 7.5

(b) Explain what is meant by frequency reuse and discuss any method by which this can be achieved. 7.5

8. Explain any *two* of the following : 15

(i) VSAT (ii) GPS

(iii) Digital DBS.

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