53 (EC 814) STCM

2018

SATELLITE COMMUNICATION

Paper : EC 814

Full Marks : 100

Time : Three hours

The figures in the margin indicate full marks for the questions.

*Answer **any five** questions out of **six**.*

1. *(a)* Name the first artifical Satellite launched by the USSR in October, 1957. Also point out its drawback for not using it too much in Satellite Communication. 1+6=7

   (b) Explain why repeater is used in satellite for the study of Satellite Communication. 7

   (c) Name the *first* Intelsat Satellite that was launched on April 16, 1965. Also explain it. 1+5=6

2. *(a)* Describe why Orbital Mechanics is required for the study of Satellite Communication. 5

(b) By using two different types of forces on the satellite, find out the equation for the velocity of a satellite in a circular orbit. 15

3. *(a)* Explain how six different orbital elements are needed for the orbital determination of a satellite. 6

(b) Define doppler shift of orbital effects in communication systems performance. 6

(c) Explain how transponder is used in communication subsystem with proper figure. 8

4. *(a)* Explain in details about Telemetry, Tracking, Command and Monitoring (TTC & M) Subsystems with its proper figures. 15

(b) Describe why subsystems are required for the Satellite Communication System. 5

5. *(a)* Explain basic transmission theory of Satellite Communication System. 10

(b) What are the *three* different prototype models which are required for space qualification of a satellite in a Satellite Communication System? 10

6. *(a)* Point out the difference between Power Subsystem and Communication Subsystem. 6

(b) Why is it necessary for satellite having two different forces on it when revolving in a circular orbit around a planet? 6

(c) Explain why Nadir and Zenith direction are required for an observer for the study of sub-satellite point in a Satellite Communication System. 8
