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53 (EC 814) STCM

2017

## 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** out of **seven** questions.

1. (a) Name the first Artificial Satellite launched by the USSR in October 1957. Also point out its main drawbacks 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) In the year 1965, the first Intelsat Satellite was launched. Name it and briefly explain about it. 6

Contd.

2. (a) Explain 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 and time required for a satellite to rotate around the planet in its orbit. 15
3. (a) Explain in details how six different orbital elements are needed for the orbital determination of a satellite with its proper diagram. 10
- (b) What are the two parameters needed for the satellite to launch in its orbit? Also explain it. 5
- (c) Define Doppler shift of orbital effect in Satellite Communication system performance. 5
4. (a) Explain in details about Telemetry, Tracking, Command and Monitoring (TTC & M) subsystems with its proper diagram. 15
- (b) Define Solar eclipse. 5

5. (a) What are the *three* different prototype models which are required for space qualification of a satellite in a Satellite Communication system? 10
- (b) Explain communication subsystem. Also explain the function of transponder present in it. 10
6. (a) Describe basic transmission Theory of a Satellite Communication system. 10
- (b) Name different equatorial orbits for the orbit consideration in a Satellite Communication. 10
7. (a) What are the narrowband and wideband system in the context of multiple access? Point out the main differences between them. 5+5=10
- (b) Explain in details what are the main features of FDMA system. 10
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