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53 (EC 814) STCM

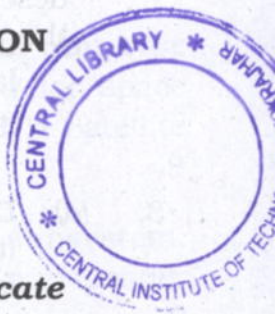
2019

**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 **seven**.

1. (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
2. (a) Explain why repeater is used in satellite for the study of Satellite Communication. 7

Contd.

(b) 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

(c) In the year 1965, the first satellite was launched. Name it and briefly explain about it. 6

3. (a) Define look angle determination with its proper diagram. Also explain why it is required in Satellite Communication. 6+1=7

(b) Explain in details, how six orbital elements are needed for the orbital determination of satellite with its proper diagram. 7

(c) Define Doppler shift of orbital effect in Satellite Communication system performance. 6

4. (a) What are the two parameters needed for the satellite to launch in its orbit? Also explain it. 5

(b) Explain why satellite subsystem is required for the Satellite Communication system. 3

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(c) Explain in details about Telemetry, Tracking, Command and Monitoring (TTC & M) subsystem with its proper diagram. 12

5. (a) What are the three different prototype models which are required for space qualification of a satellite in a Satellite Communication System? 8

(b) Explain Communication subsystem. Also explain the function of transponder present in it. 10

(c) Point out the main difference between Power sub-system and Communication subsystem. 2

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) Define System noise temperature.

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(b) Explain Antenna subsystem in details. 6

(c) Explain the design of downlinks of a Satellite Communication system. Also describe the link budget calculation of the above design. 10

