



# CBCS SCHEME

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15EC755

## Seventh Semester B.E. Degree Examination, July/August 2022 Satellite Communication

Time: 3 hrs.

Max. Marks: 80

*Note: Answer any FIVE full questions, choosing ONE full question from each module.*

### Module-1

- 1 a. What is satellite communication? List the application and some of the services provided by the satellite. (06 Marks)
- b. Explain how a satellite continues to be in orbit and derive an expressions for :
  - (i) Satellite velocity
  - (ii) Orbital period(10 Marks)

OR

- 2 a. Define and explain elevation and Azimuth angles of a ground station antenna for communication with an orbiting satellite. (10 Marks)
- b. Describe briefly the main advantages offered by satellite communication. Explain what is meant by distance in sensitive communication system. (06 Marks)

### Module-2

- 3 a. Write a neat block diagram, explain tracking telemetry and command subsystems. (08 Marks)
- b. Explain earth station types. (08 Marks)

OR

- 4 a. Explain the earth station architecture. (08 Marks)
- b. Explain attitude and orbit control system. (08 Marks)

### Module-3

- 5 a. Explain SCPC systems (Single Channel Per Carrier System) using PSK. (08 Marks)
- b. Derive transmission equation. (08 Marks)

OR

- 6 a. Explain transponder arrangement for an SDMA system. (06 Marks)
- b. A geostationary satellite at a distance of 36,000 km from the surface of the earth radiates a power of 10 Watts in the desired direction through an antenna having a gain of 20 dB, what would be the power density at a receiving site on the surface of the earth and also the power received by an antenna having an effective aperture of 10 m<sup>2</sup>. (04 Marks)
- c. Explain Ionospheric Scintillation. (06 Marks)

### Module-4

- 7 a. Explain a typical satellite TV network. (08 Marks)
- b. What are the advantages and disadvantages of satellite over terrestrial network? (08 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

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OR

- 8 a. Explain direct to home satellite television (DTH). (08 Marks)  
b. Explain different types of transponders. (08 Marks)

**Module-5**

- 9 a. Explain the principle and operation of GPS system. (08 Marks)  
b. Explain the principle and operation of scatarometer and altimeter. (08 Marks)

OR

- 10 a. Explain various types of sensors on board remote sensing satellites. (10 Marks)  
b. Explain the principle of operation of Doppler effect based satellite navigation system. (06 Marks)

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