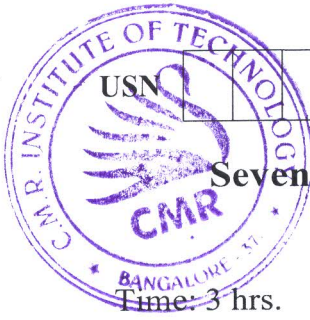


CBCS SCHEME



17EC755

Seventh Semester B.E. Degree Examination, Dec.2023/Jan.2024 Satellite Communication

Max. Marks: 100

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

Module-1

- 1 a. Explain Kepler's law of motion of an artificial satellite around earth. (10 Marks)
b. Explain briefly five orbital parameters required to determine a satellite orbit. (10 Marks)

OR

- 2 a. Explain briefly the following:
(i) Sun transit outage (08 Marks)
(ii) Earth eclipse of satellite (06 Marks)
b. Define Azimuth and Elevation. (06 Marks)
c. Determine the angle of tilt required for a polar mount used with an earth station at latitude 49° North. Assume a spherical earth of mean radius 6371 km and ignore earth station altitude. (06 Marks)

Module-2

- 3 a. Explain solar energy driven power supply system of a satellite. (10 Marks)
b. Explain telemetry, tracking and command subsystem. (10 Marks)

OR

- 4 a. Describe with neat block diagram the satellite tracking system. (10 Marks)
b. List and explain the types of earth stations on the basis of service provided by them and their usage. (10 Marks)

Module-3

- 5 a. Describe the important parameters that influence the design of a satellite communication link. (06 Marks)
b. Explain general TDMA frame structure. (08 Marks)
c. In a DS-SS system the information bit rate and chip rate 20 kbps and 20 Mbps respectively. Determine the processing gain in dB. (06 Marks)

OR

- 6 a. With usual notation, derive satellite transmission equation. (06 Marks)
b. Compare FDMA system, TDMA system and CDMA system. (06 Marks)
c. A geostationary satellite at a distance of 36000 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 earth and also power received by an antenna having an effective aperture of 10 m². (08 Marks)

Module-4

- 7 a. What is transponder? Explain the types of transponders used in satellite. (10 Marks)
b. With neat sketches, explain VSAT. (10 Marks)

OR

- 8 a. Explain communication related application of satellites. (06 Marks)
b. List the frequency bands used in satellite communication. (06 Marks)
c. Discuss the advantages and disadvantages of satellite over terrestrial network. (08 Marks)

Module-5

- 9 a. What is Remote Sensing Satellite System? What are its applications? (10 Marks)
b. Explain the working principle of GPS. (10 Marks)

OR

- 10 a. Explain the weather forecasting satellite payload. (08 Marks)
b. Classify the sensors used in remote sensing satellites. (06 Marks)
c. Explain the principle of working of thermal infrared remote sensing. (06 Marks)

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