CBCS SCHEME

USN | | | | | | | | | | |

17EC755

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

Time: 3 hrs. Max. Marks: 100

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

Module-1

1 a. Briefly explain any six orbital parameters required to determine a satellite orbit. **(08 Marks)**

b. State and explain the Kepler's laws of planetary motion with neat diagram and necessary equations. **(07 Marks)**

c. A satellite is moving in an elliptical orbit with the major axis is equal to 42000 km. If the perigee distance is 8000 km, find the apogee and the eccentricity. **(05 Marks)**

OR

2 a. Explain basic principles of orbiting satellites. **(06 Marks)**

b. Describe the different types of satellite orbits. **(07 Marks)**

c. Two different geostationary satellites in INSAT series are located at 74°E and 94°E. Determine the line of distance between the two satellites orbiting the earth at a height of about 36000 km above the surface of the earth. Assume radius of earth to 6370 km. **(07 Marks)**

Module-2

3 a. Explain solar driven energy supply system of a satellite. **(06 Marks)**

b. Explain basic block schematic arrangement of a regulated bus power supply system. **(06 Marks)**

c. Explain TT and C subsystem with schematic block diagram. **(08 Marks)**

OR

4 a. Explain with neat block diagram earth station architecture. **(10 Marks)**

b. Describe with neat block diagram the satellite tracking system and explain any four tracking techniques. **(10 Marks)**

Module-3

5 a. Explain TDMA typical frame structure. **(08 Marks)**

b. Mention the advantages and disadvantages of TDMA over FDMA. **(08 Marks)**

c. In a DS-CDMA system the information bit rate and chip rate are 20 Kbps and 20 Mbps respectively. Determine the processing gain in dB. **(04 Marks)**

OR

6 a. A geostationary satellite at a distance of 36000 km from the surface of earth radiates a power of 10 W 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^2? **(06 Marks)**

b. Explain satellite link parameters. **(08 Marks)**

c. Explain fixed, broadcast and mobile satellite services. **(06 Marks)**

Module-4

7 a. Explain with neat block diagram basic elements of a satellite communication system. (10 Marks)

b. Explain with neat diagram satellite point to point telephone networks. (10 Marks)

OR

8 a. Explain the advantages and disadvantages of satellite over terrestrial networks. (10 Marks)

b. Explain with neat diagram satellite cable TV. (10 Marks)

Module-5

9 a. Explain optical, thermal and microwave remote sensing systems. (08 Marks)

b. What is remote sensing satellite system? Explain its application. (08 Marks)

c. Classify satellite remote sensing system based on radiation for data acquisition, explain briefly. (04 Marks)

OR

10 a. Explain the working principles of Global Positioning Satellite (GPS) system. (08 Marks)

b. What are Military and Civilian Application of Satellite Navigation system. (06 Marks)

c. Explain Weather Forecasting Satellite Payload. (06 Marks)

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