

CBCS SCHEME

17EC755



USN

Seventh Semester B.E. Degree Examination, June/July 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. Define :
 - i) Orbit
 - ii) Trajectory
 - iii) Apogee
 - iv) Newton's second law of motion
 - v) Argument of perigee. (08 Marks)
- b. State and explain the Kepler's laws of planetary motion with a neat diagram and necessary equations. (08 Marks)
- c. The apogee and perigee distance of a satellite orbiting in an elliptical orbit are respectively 45000km and 7000kms. Determine the following :
 - i) Semimajor axis of the elliptical orbit
 - ii) Orbit eccentricity
 - iii) Distance between the center of earth and the center of elliptical orbit. (04 Marks)

OR

- 2 a. Explain Azimuth angle and elevation angle. (08 Marks)
- b. With a neat sketch explain injection velocity and resulting satellite trajectories. (08 Marks)
- c. The difference between the farthest and the closest points in a satellite's elliptical orbit from the surface of the earth is 30000km and the sum of the distances is 50000km. If the mean radius of the earth is considered to be 6400km determine the orbit eccentricity. (04 Marks)

Module-2

- 3 a. Explain with neat block diagram earth station architecture (10 Marks)
- b. Discuss satellite stabilization techniques and compare them. (10 Marks)

OR

- 4 a. With a neat sketch, explain the working principle of solar cell and Batteries used on board satellites. (10 Marks)
- b. Explain the need and role of power system. (10 Marks)

Module-3

- 5 a. Explain TDMA typical frame structure. (10 Marks)
- b. Explain SDMA/FDMA system and SDMA/TDMA system with neat diagram. (10 Marks)

OR

- 6 a. With neat schematic explain FH-CDMA and TH – CDMA systems. (10 Marks)
- b. Discuss the parameters that influence the design of satellite communication link. (10 Marks)

Module-4

- 7 a. Explain with a neat diagram, basic elements of satellite communication system. (10 Marks)
- b. Discuss the advantages and disadvantages of satellite over terrestrial network. (10 Marks)

OR

- 8 a. With neat sketch explain types of transponder in satellite communication system. (10 Marks)
b. Write short notes on satellite telephony with necessary diagram. (10 Marks)

Module-5

- 9 a. Discuss the types of images taken by weather forecasting satellites. (10 Marks)
b. Explain working principle of GPS. (10 Marks)

OR

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- 10 a. List and explain applications of remote sensing satellite. (10 Marks)
b. Explain optical, thermal and microwave remote sensing them. (10 Marks)

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