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Seventh Semester B.E. Degree Examination, July/August 2022 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 the following:
 - i) Orbit and trajectory
 - ii) Ascending and descending nodes in an orbit
 - iii) Apogee and Perigee distance
 - iv) Semimajor and Semiminor axis
 - v) Umbra and penumbra region of an eclipse. (10 Marks)
- b. Explain different types of satellite orbits. (10 Marks)

OR

- 2 a. Explain three Keplers law of planetary motion. (10 Marks)
- b. i) A satellite is located at 37° west and another located at 74° East. If both these satellites are in circular equatorial geostationary orbit with an orbital radius of 42164km, determine the inter-satellite distance. (05 Marks)
- ii) Explain satellite spin stabilization technique employed for altitude control of a satellite. (05 Marks)

Module-2

- 3 a. Explain the block schematic arrangement of a basic TT&C subsystem. (10 Marks)
- b. Explain the different subsystems of a satellite. (10 Marks)

OR

- 4 a. With neat sketch, explain different types of Earth station antennas used in satellite communication. (10 Marks)
- b. Mention different satellite tracking techniques classified on the basis of methodology used. Explain monopulse tracking. (10 Marks)

Module-3

- 5 a. With typical block diagram, explain the two common forms of MCPC systems. (10 Marks)
- b. Explain the important parameters that influence the design of a satellite communication link. (10 Marks)

OR

- 6 a. Show how transmission equation relates the received power level, transmitted RF power, operating frequency and transmitter, receiver distance. (10 Marks)
- b. i) Explain how frequency reuse is employed in SDMA. (05 Marks)
- ii) Explain SDMA/FDMA system. (05 Marks)

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.

Module-4

- 7 a. Mention the different frequency bands employed in satellite communication, explain basic elements of a satellite communication system. (10 Marks)
b. Explain the advantages and disadvantages of satellite networks over terrestrial networks. (10 Marks)

OR

- 8 a. Mention the types of transponders, explain bent pipe (or) transparent transponder. (10 Marks)
b. Explain with neat diagram a satellite cable television. (10 Marks)

Module-5

- 9 a. Explain the various sensor systems on board of a remote sensing satellite. (10 Marks)
b. Write a note on how image of Earth's surface is constructed by the data sent by the satellite sensors. (10 Marks)

OR

- 10 a. Define how remote sensing systems are classified explain active microwave remote sensing. (10 Marks)
b. Explain the various applications of a remote sensing satellites. (10 Marks)

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