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Seventh Semester B.E./B.Tech. Degree Examination, Dec.2025/Jan.2026
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 with neat diagrams: (10 Marks)
- i) Apogee, Perigee
 - ii) Ascending node and Descending node
 - iii) Inclination
 - iv) Argument of perigee
 - v) Right ascension of ascending node
- b. Discuss the effect of injection velocity on satellite trajectory with neat sketches. (07 Marks)
- c. Classify the types of satellite orbits. (03 Marks)

OR

- 2 a. Explain earth eclipse of satellite and sun transit outage with neat diagrams. (10 Marks)
- b. A geostationary satellite is located at $90^\circ W$. Calculate the azimuth angle for an earth-station antenna at latitude $35^\circ N$ and longitude $100^\circ W$. Find elevation angle by assuming radius of earth = 6370 km. (07 Marks)
- c. State Kepler's third law of planetary motion. (03 Marks)

Module-2

- 3 a. Explain basic block schematic of a regulated bus power supply system. (10 Marks)
- b. Explain TT and C with neat block diagram. (07 Marks)
- c. List the types of payloads used in satellites. (03 Marks)

OR

- 4 a. Explain typical architecture of an earth station. (10 Marks)
- b. Explain satellite tracking techniques with neat diagrams. (07 Marks)
- c. Classify earth station based on service and usage. (03 Marks)

Module-3

- 5 a. Explain DS-CDMA, FH-CDMA, TH-CDMA transmitter and receiver with neat block diagram. (10 Marks)
- b. Explain TDMA frame structure. (07 Marks)
- c. Classify FDMA types. (03 Marks)

OR

- 6 a. With suitable notations, derive satellite transmission equation. (10 Marks)
- b. Discuss propagation considerations in satellite communication. (07 Marks)
- c. List frequency bands used in satellite communication. (03 Marks)

Module-4

- 7 a. What is Transponder? Explain bent pipe transponder with neat block diagram. (10 Marks)
- b. Compare merits and demerits of satellite over terrestrial network. (07 Marks)
- c. Write short note on communication related application of satellites. (03 Marks)

OR

- 8 a. Explain a typical satellite T.V network. (07 Marks)
- b. Explain : (10 Marks)
- i) Typical DBS service
 - ii) Satellite Telephony
- c. List VSAT network topologies. (03 Marks)

Module-5

- 9 a. Explain the payload used in remote sensing systems. (10 Marks)
- b. Explain remote sensing based on spectral radiation. (07 Marks)
- c. What is remote sensing? (03 Marks)

OR

- 10 a. With neat block diagram, explain generation of L1 and L2 signals in GPS system. (10 Marks)
- b. Explain GPS navigation system. (07 Marks)
- c. Mention few applications of (03 Marks)
- i) Remote sensing satellites
 - ii) Weather forecasting satellites
 - iii) Navigation satellite system

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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