



Seventh Semester B.E. Degree Examination, Dec.2019/Jan.2020 Satellite Communication

Time: 3 hrs.

Max. Marks: 80

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

Module-1

- 1 a. Explain Kepler's Laws of planetary motion. Also derive expression for orbital period. (08 Marks)
- b. With neat sketches, define :
- i) Apogee and perigee
 - ii) Prograde and retrograde orbit
 - iii) Inclination
 - iv) Argument of perigee. (08 Marks)

OR

- 2 a. Explain briefly the following :
- i) Orbital perturbation (08 Marks)
 - ii) Sun transit outage and Earth eclipse of satellite. (04 Marks)
- b. i) Define Azimuth and Elevation. (04 Marks)
- ii) An Earth station located at $30^{\circ}W$ longitude and $60^{\circ}N$ latitude. Determine look angle parameters with respect to GEO satellite located at $50^{\circ}W$ longitude. The orbital radius is 42164km. (Assume radius of earth to be 6378km). (04 Marks)

Module-2

- 3 a. i) Mention functions carried by different subsystems of a typical satellite. (08 Marks)
- ii) With neat sketches, explain the working of solar cell. (08 Marks)
- b. Explain Telemetry, tracking and command subsystem. (08 Marks)

OR

- 4 a. Explain Earth station architecture with neat block diagram. (08 Marks)
- b. Explain satellite tracking techniques. (08 Marks)

Module-3

- 5 a. Explain :
- i) Demand assigned FDMA (08 Marks)
 - ii) Pre-assigned FDMA. (08 Marks)
- b. Explain general TDMA frame structure. (08 Marks)

OR

- 6 a. With usual notation, derive satellite transmission equation. (06 Marks)
b. Discuss the parameters influence the design of satellite communication link. (10 Marks)

Module-4

- 7 a. i) Explain communication related application of satellites. (08 Marks)
ii) List the frequency bands used in satellite communication. (08 Marks)
b. With neat sketches, explain VSAT. (08 Marks)

OR

- 8 a. Define transponder. Explain the types of transponders used in satellite. (08 Marks)
b. Discuss the advantages and disadvantages of satellite over terrestrial network. (08 Marks)

Module-5

- 9 a. With neat sketches, explain the principle of working of :
i) Optical remote sensing (08 Marks)
ii) Thermal infrared remote sensing. (08 Marks)
b. Classify the sensors used in remote sensing satellites. (08 Marks)

OR

- 10 a. i) Discuss the types of images taken by weather forecasting satellites. (08 Marks)
ii) Mention the applications of weather forecasting satellites. (08 Marks)
b. Explain the working principle of GPS. (08 Marks)
