

Sixth Semester B.E. Degree Examination, December 2010
Satellite Communication

Time: 3 hrs.

Max. Marks:100

Note: Answer any FIVE full questions, choosing at least two questions from each part.

PART – A

- 1 a. What are the frequency bands allocated to various satellite services? (04 Marks)
 b. State and explain the Kepler's laws of planetary motion. (08 Marks)
 c. Define the terms: i) Prograde orbit ii) Apogee
 iii) Argument of perigee iv) Ascending node. (08 Marks)
- 2 a. Determine the rate of regression of the nodes and the rate of rotation of the line of apsides for a satellite making 14.23304826 revolutions / day. The semimajor axis of the orbit is 7192.3 km, orbit eccentricity is 0.0011501 and the inclination is 98.6328 deg. (08 Marks)
 b. Explain earth eclipse of satellite. (06 Marks)
 c. Differentiate sidereal day and solar day. (04 Marks)
 d. Explain sun transit outage. (02 Marks)
- 3 a. Explain atmospheric losses and ionospheric losses for satellites. (08 Marks)
 b. The noise figure for the system shown in Fig. Q3 (b) is 12 dB, the cable loss is 5 dB, the LNA gain is 50 dB and its noise temperature is 150 K. The antenna noise temperature is 35 K. Calculate the noise temperature referred to the input. (05 Marks)

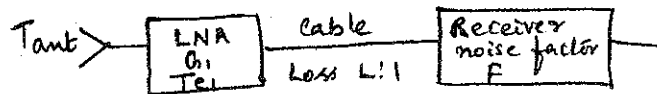


Fig. Q3 (b)

- c. Explain combined uplink and downlink C/N ratio. (07 Marks)
- 4 a. Explain : i) the power supply subsystem ii) the thermal control subsystem. (08 Marks)
 b. With the help of a neat diagram, explain the operation of a power amplifier of a transponder along with its transfer characteristics. (12 Marks)

PART – B

- 5 a. Explain the 'receive only' home TV system. (13 Marks)
 b. Explain a MATV system, with a neat diagram. (07 Marks)
- 6 a. An FM/TV carrier is specified as having a modulation index of 2.571 and a top modulating frequency of 4.2 MHz. Calculate the protection ratio required to give a quality impairment factor of (i) 4.2 and (ii) 4.5. (06 Marks)
 b. Explain possible interference nodes between satellite circuits and a terrestrial station. (07 Marks)
 c. Explain spade system. (07 Marks)
- 7 a. Explain the following: i) Transponder capacity ii) Frequencies and polarization. (08 Marks)
 b. Explain in detail the satellite mobile services. (12 Marks)
- 8 Write short notes on:
 - a. INTELSAT.
 - b. Radarsat.
 - c. Polar mount antenna.
 - d. Iridium. (20 Marks)

