10EC662

Sixth Semester B.E. Degree Examination, June/July 2019
Satellite Communication

Time: 3 hrs.

Max. Marks:100

Note: *Answer FIVE full questions, selecting*
at least TWO questions from each part.

PART – A

1 a. Explain the various frequency bands used and various services provided by a satellite.
(08 Marks)

b. State and explain Kepler's three laws of planetary motion with the help of neat diagram and necessary equations. (08 Marks)

c. A satellite in an elliptical orbit has a perigee of 1000 km and apogee of 4000 km. If mean earth radius is 6371 km, find the period of the orbit in minutes. (04 Marks)

2 a. Define Keplerian elemental set. (06 Marks)

b. An earth station is located at latitude 30°S and longitude 65°E. Calculate the antenna look angles for the satellite at 156°E. (08 Marks)

c. Explain the phenomena of earth eclipse and sun transit outage. (06 Marks)

3 a. Explain different types of transmission losses in a satellite link. (10 Marks)

b. The noise figure for the system shown is 12 dB, cable loss is 5 dB, LNA gain is 50 dB and its noise temperature is 150°K. The antenna noise temperature is 35°K, calculate the noise temperature.
(i)   for cable loss before LNA.
(ii) for cable loss after LNA. (06 Marks)
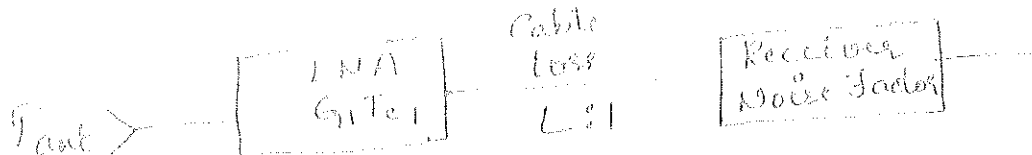

Fig. Q3 (b)

c. What is meant by EIRP and obtain an expression for it in dbW. (04 Marks)

4 a. What is meant by satellite altitude? Explain three axis method of satellite stabilization.
(08 Marks)

b. With the help of neat diagram, explain TTC and M subsystem. (08 Marks)

c. Explain thermal control subsystem in satellite and the methods to control it. (04 Marks)

PART – B

5 a. Explain the indoor and outdoor units of DBS TV receiver. (08 Marks)

b. Explain MATV with diagram. (06 Marks)

c. Explain SPADE system with a neat diagram. (06 Marks)

6 a. Explain preassigned FDMA with a neat diagram for SCPC in Intelsat for 36 MHz Transponder. (10 Marks)

b. Explain the Frame and Burst formats for a TDMA system. (10 Marks)

7 a. With respect to DBS, explain (i) Orbital spacing   (ii) Power rating and number of transponders   (iii) Frequency   (iv) Polarization   (v) Transponder capacity.
                                                                                                      (10 Marks)
   b. Explain in detail the satellite mobile services.   (10 Marks)

8 a. Explain the operation of VSAT system.   (07 Marks)
   b. Explain the Global positioning system in detail.   (07 Marks)
   c. Give the application of Radasat. Explain a down to dusk orbit.   (06 Marks)

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