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10EC662

Sixth Semester B.E. Degree Examination, Jan./Feb.2021
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. List the frequency-band designation, Which are in common use for satellite sources? (06 Marks)
b. What is INTELSAT? How it covers the International traffic? (04 Marks)
c. With the help of neat diagram, explain Keplerian orbital elements with necessary equations. (10 Marks)
- 2 a. Explain what are orbit perturbations that take place because of non-sphericity nature of earth. (06 Marks)
b. With the help of a neat sketch, explain, (i) Inclination (ii) Right ascension of ascending node (iii) Argument of perigee (iv) Apogee and Perigee points. (10 Marks)
c. The orbit for an earth orbiting satellite has an eccentricity of 0.15 and semi major axis of 9000 kms. Determine : (i) Periodic time, (ii) Apogee height (iii) Perigee height
Given $h = 3.986 \times 10^5 \text{ km}^3/\text{s}^2$. Assume a mean value of 6371 kms for earth's radius. (04 Marks)
- 3 a. Explain what is meant by EIRP. A satellite downlink at 12 GHz operates with a transmit power of 6 W and an antenna gain of 48.2 dB. Calculate the EIRP in dBW. (08 Marks)
b. Explain atmospheric losses and ionospheric losses for satellites. (06 Marks)
c. What is meant by rain rate? And how this is related to specific attenuation? Explain. (06 Marks)
- 4 a. With the help of neat diagram, explain two forms of attitude control. (12 Marks)
b. What is a satellite transponder? With a neat diagram, explain the overall frequency arrangement of typical C-band communication satellite. (08 Marks)

PART – B

- 5 a. Compare CATV and MATV system. (07 Marks)
b. Explain with help of a neat diagram for home terminal DBS TV/FM reception. (07 Marks)
c. With the aid of a block diagram, describe the functioning transmit-receive earth station. (06 Marks)
- 6 a. Explain working of spade system. (07 Marks)
b. Explain possible interference nodes between satellite circuits and a terrestrial station. (07 Marks)
c. Briefly explain satellite switched TDMA. (06 Marks)
- 7 a. Explain the following:
(i) Transponder capacity (08 Marks)
(ii) Radarsat. (12 Marks)
b. Explain in detail the satellite mobile services. (12 Marks)
- 8 Write short notes on:
a. DBS TV.
b. Antenna look angles.
c. GPS.
d. VSAT and its applications. (20 Marks)

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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.