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10EC662

## Sixth Semester B.E. Degree Examination, June/July 2018

### Satellite Communication

Time: 3 hrs.

Max. Marks:100

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

#### PART - A

- 1 a. What is satellite communication? List and explain the services provided by satellite communication. (06 Marks)
- b. State Keplers three laws of planetary motion with the help of neat diagram and necessary equations. (08 Marks)
- c. The apogee and perigee of an elliptical satellite orbit are 3000kms and 200kms. Determine the eccentricity semi major axis and semi minor axis. (06 Marks)
- 2 a. With the help of a neat sketch explain, i) Inclination ii) RAAN iii) Argument of Perigee (06 Marks)
- b. What are antenna look angles? How they are determined? (06 Marks)
- c. Give the conditions for geostationary orbit. Determine the angle of tilt required for polar mount antenna used with an earth station at latitude 49°N assume earth's mean radius 6371 kms. (08 Marks)
- 3 a. Explain atmospheric and ionospheric losses for satellites. (06 Marks)
- b. Show that the rain attenuation in dB is given by  $A_p = \alpha R_p^b L_s r_p$  dB with usual notation. (08 Marks)
- c. For the system given in Fig.Q.3(c)(i) and (ii), the receiver noise figure is 12dB, cable loss 5dB LNA gain 50dB and its noise temperature 150K, antenna noise temperature 35K. Calculate noise temperature referred to input conclude the result. (06 Marks)

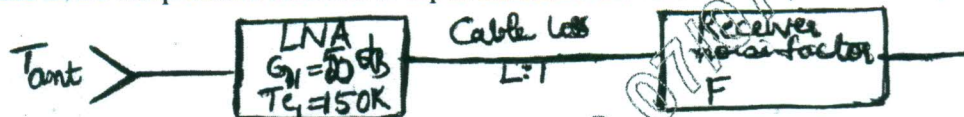


Fig.Q.3(c)(i)



Fig.Q.3(c)(ii)

- 4 a. With the help of neat diagram, explain two forms of attitude control. (10 Marks)
- b. What is satellite transponder? With neat diagram explain the overall frequency arrangement of typical C-band communication satellite. (06 Marks)
- c. Write a short note on Thermal control. (04 Marks)

#### PART - B

- 5 a. With the aid of block diagram, explain the indoor and outdoor Venets of a receive only home TV system. (10 Marks)
- b. With the aid of a block diagram, describe the functioning of transmit receive earth station. (10 Marks)



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- 6 a. What is meant by pre-assigned FDMA? With a neat diagram, explain single channel per carrier. (10 Marks)
- b. Explain what the abbreviation "SPADE" system stands for. Explain in detail the operation of spade system. (10 Marks)
- 7 a. Explain the following:
- i) Transponder capacity
  - ii) Frequency and polarization
  - iii) Bit rate and digital TV. (10 Marks)
- b. Explain in detail Very Small Aperture Terminal (VSAT) and its applications. (05 Marks)
- c. Explain in detail the Global positioning system. (05 Marks)
- 8 Write short notes on:
- a. Radarsat
  - b. Orbital communication
  - c. Earth eclipse of satellite
  - d. Iridium. (20 Marks)

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