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P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belgaum)

Seventh Semester, B.E. - Electronics and Communication Engineering

Semester End Examination; Dec. - 2015

Satellite Communication

Time: 3 hrs *Max. Marks: 100*

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

PART - A

1 a. Explain the following terms with the neat sketch :
i) Argument of perigee ii) Right ascension of ascending node
iii) Mean Anomaly iv) True Anomaly. 8

b. Explain the effects due to non - spherical earth. 6

c. Calculate the apogee and perigee heights for the following orbital parameters, e = 0.0011501, a = 7192.335 km. Assume a mean earth radius of 6371 km. 6

2 a. Show that the local mean time must remain constant for sun - synchronous orbit. 6

b. Derive the expression for determining the Azimuth and Elevation angle of satellite antenna. 8

c. Determine the limits of visibility for an earth station situated at mean sea level, at latitude 48.42° N and longitude 89.26° W. Assume a minimum angle of elevation of 5°. 6

3 a. Discuss effective path length with respect to rain attenuation. 6

b. Define noise factor and show that at room temperature the noise factor of a lossy network is equal to its power loss. 8

c. Derive the expression for combined uplink and down link C/N ratio. 6

4 a. Discuss briefly the two forms of attitude control. 8

b. Why station keeping is necessary explain. 6

c. Explain satellite wide band receiver with a block diagram. 6

PART - B

5 a. Explain the master - antenna TV system. 6

b. Discuss B_1 and B_2 mode of interference between satellite circuits with a neat figure. 6

c. With a block diagram describe the functioning of a Transmit - Receive earth station used for telephonic traffic. 8

6 a. Discuss the spade communication system with neat sketch. 7

b. Explain the basic principle of buess transmission in TDMA. 6

c. Discuss satellite switched TDMA with neat figure. 7

7 a. Explain the following: i) Transponder capacity ii) Bit rates for digital Television. 10

b. With a neat block diagram discuss MPEG - 2 encoder system. 10

8 a. Explain the operation of typical VSAT system. 7

b. Discuss the features and applications of Radarsat. 6

c. Describe the features and advantages of Iridium system. 7

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