USN ☐☐☐☐☐☐☐☐☐☐ 06EC662

Sixth Semester B.E. Degree Examination, Dec.2013/Jan.2014
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. What are the advantages of satellite communications? Explain the various services provided by a satellite. **(08 Marks)**
    b. Explain the Kepler's three laws of planetary motion. **(12 Marks)**

2   a. Explain the following terms: i) Line of apsides; ii) Ascending node; iii) Descending node. **(06 Marks)**
    b. A satellite is orbiting in the equatorial plane with a orbital period of 12h. Given that eccentricity is 0.002, calculate the semimajor axis. The earth's equatorial radius is 6378.1414 km. **(06 Marks)**
    c. Explain the earth eclipse of satellite and sun transit outage. **(08 Marks)**

3   a. Explain atmospheric losses and ionospheric losses for satellites. **(08 Marks)**
    b. Explain the different types of transmission losses in satellite link. **(08 Marks)**
    c. Explain carrier to noise ratio of a satellite link. **(04 Marks)**

4   a. What is meant by thermal control? And why this is necessary in a satellite? **(06 Marks)**
    b. Explain with a block diagram. TT and C sub system. **(08 Marks)**
    c. What is meant by redundant receiver? Explain the working of a wideband receiver. **(06 Marks)**

PART – B

5   a. What is meant by DBS service? With a block diagram, explain home terminal for DBS TV/FM reception. **(10 Marks)**
    b. With a block diagram, explain the functioning of transmit receive earth station. **(10 Marks)**

6   a. Describe briefly the modes of interference that can occur in a satellite communications system. **(08 Marks)**
    b. Station A transmits at 24 dBW with an antenna gain of 54 dB and station C transmits at 30dBW. The off axis gain in the S_1 direction is 24.47 dB, and the polarization discrimination is 4dB. Calculate the [C/I] ratio on the uplink. **(04 Marks)**
    c. Explain the working of spade system. **(08 Marks)**

7   a. Explain the following: i) Frequencies and polarization; ii) Transponder capacity. **(08 Marks)**
    b. Explain in brief the satellite mobile services. **(06 Marks)**
    c. Describe the operation of VSAT system. **(06 Marks)**

8   Write short notes on:
    a. TDMA
    b. GPS
    c. Master antenna TV system
    d. Bit rates for digital television. **(20 Marks)**

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