Total No. of Questions : 8] [Total No. of Printed Pages : 3

Roll No. .....

EC–7201

B. E. (Seventh Semester)
EXAMINATION, Dec., 2011
(Electronics & Communication Engg. Branch)
SATELLITE COMMUNICATION
(Elective – II)
(EC – 7201)

Time : Three Hours

Maximum Marks : 100

Minimum Pass Marks : 35

Note : Attempt any *five* questions. Assume suitable data if any missing.

1. (a) Discuss briefly the three Kepler's laws used for describing planetary motion and briefly explain the terms used to describe the position of the orbit with respect to earth. 7

   (b) What type of antenna is commonly used in satellite communication systems ? 5

   (c) The semimajor axis and semiminor axis of an elliptical satellite orbit are 20000 km and 16000 km respectively. Determine the apogee and the perigee. 8

2. (a) Explain altitude and orbit control technique used in satellite. 8

   (b) Explain TDMA frame structure and synchronization in TDMA network. 7

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(c) Satellite 1 in an elliptical orbit has the orbit semi-major axis equal to 18000 km and satellite 2 in an elliptical orbit has semi-major axis equal to 24000 km. Determine the relationship between their orbital periods. 5

3. (a) What is the function CDMA chip sequence ? 4

(b) CDMA is also known as spread spectrum, why is it so ? 4

(c) Is CDMA widely adopted by satellite communication systems ? Support you answer with relevant reasoning. 12

4. (a) What is the underlying concept behind VSAT ? 3

(b) What is Spoofing ? 4

(c) What are the major elements that concern VSAT systems designs ? 5

(d) What are the factors that often determine the choice between FDMA, TDMA and CDMA for VSAT networks ? 8

5. (a) Write the equations for the gain and the –3 dB beamwidth for a parabolic reflector antenna and comment on the key factor in the equations. 7

(b) Draw the block diagram of an earth station. 7

(c) What is transponder ? Draw its block diagram. 6

6. (a) Distinguish between multiple accesses and multiplexing. 7

(b) An earth station is located at 79·34 W longitude and 37·09° N latitude. Calculate its look angle and range to a geosynchronous satellite whose subsatellite point is located at 102° W longitude. 13

7. A satellite transmits with EIRP of 46 dBW. Calculate the received carrier to noise ratio if the band width is 35 MHz and the receiver has a G/T of 25 dB/K. Assume the distance between the earth and the satellite is 35,786 km. 20

8. Write short notes on the following : 20
   (i) Launch vehicle
   (ii) Spade
   (iii) Intermodulation noise

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