R09

Code No: C6109, C6509

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
M.TECH I - SEMESTER EXAMINATIONS APRIL/MAY-2012
SATELLITE COMMUNICATIONS
(COMMON TO COMMUNICATION SYSTEMS, WIRELESS & MOBILE COMMUNICATIONS)

Time: 3hours **Max.Marks:60**

Answer any five questions
All questions carry equal marks

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1.a) What should be the velocity of the satellite if it orbits around earth at a distance of 1000 Km and weighs 200 Kg.
b) Differentiate between orbital and elevation angles of a satellite.
c) Indicate the four main sequences for placing a Geosynchronous satellite into permanent orbit. Briefly explain about them.

2.a) Explain what is meant by satellite attitude and briefly describe two forms of attitude control.
b) Briefly describe the three-axis method of satellite stabilization.

3.a) With the aid of a block schematic, describe the functioning of transmit-receive earth station used for telephone traffic.
b) In a satellite link, the propagation loss is 200dB. Margins and other losses account for another 3dB. The receiver G/T is 11dB and the EIRP is 45dBW. Calculate the received C/N for a system bandwidth of 36MHz.

4.a) Explain what is meant by orthogonal polarization and the importance of this in satellite communication.
b) Differentiate between cross-polarization discrimination and polarization isolation.
c) A transmission path between an earth station and a satellite has an angle of elevation of 32^0 with reference to the earth. The transmission is circularly polarized at a frequency of 12GHz. Calculate the cross polarization discrimination when rain attenuation on the path is 1dB.

5.a) Discuss briefly how demand assignment may be implemented in a TDMA network. What is the advantage of TDMA over FDMA in this respect?
b) What are the functions of (i) The burst code word and (ii) The carrier and bit-timing recovery channel in a TDMA burst?

6.a) Distinguish between bandwidth-limited and power limited operation as applied to an FDMA network.
b) Explain in detail the operation of a pre-assigned SCPC network.

7.a) Differentiate between pure ALOHA and slotted ALOHA.
b) In general practice, random multiple access protocols employ randomized retransmissions to resolve packet collision. Explain the use of tree algorithm for resolving the conflict.

8. Write short notes on:
i) Satellite frequency bands
ii) TT & C subsystem
iii) Faraday rotation.

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