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10EC662

Sixth Semester B.E. Degree Examination, June/July 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. Illustrate basic structure of a satellite communication. List the applications. (06 Marks)
 - b. Explain briefly the various services provided by a satellite. (06 Marks)
 - c. With suitable diagram, compare Low Earth Orbit (LEO), Medium Earth Orbit (MEO), Geostationary orbit (GEO) satellite and its parameters. (08 Marks)
- 2
 - a. Explain what are the orbital perturbation that take place because of non-spherical earth. (06 Marks)
 - b. Explain in detail six orbital elements. (06 Marks)
 - c. Explain with neat diagram the Earth eclipse of satellite and sun transit outage. (08 Marks)
- 3
 - a. Explain what is effective path length. Show that the Rain Attenuation in dB is given by $A_p = aR_p^b L_s r_p$ with a neat diagram. (08 Marks)
 - b. Explain different transmission losses in a satellite link. (06 Marks)
 - c. A satellite link operating at 14 GHz has receiver feeder losses of 1.5 dB and a free space loss of 207 dB. The atmospheric absorption loss is 0.5 dB and the antenna pointing loss is 0.5 dB. Depolarization loss may be neglected. Calculate the total link loss for clear sky conditions? (06 Marks)
- 4
 - a. List out the major sub-systems required on satellite. (06 Marks)
 - b. Explain attitude and orbit control system. (06 Marks)
 - c. With a neat diagram explain telemetry, tracking command and monitoring system. (08 Marks)

PART – B

- 5
 - a. Explain with block diagram a Home Terminal for DBS TV/FM reception. (10 Marks)
 - b. Explain with block diagram a transmit-receive earth station. (10 Marks)
- 6
 - a. Describe briefly the modes of interference in a satellite communication system. Distinguish between satellite and terrestrial interference. (10 Marks)
 - b. Explain spade communication system with a neat diagram. Also, the channeling scheme for spade system. (10 Marks)
- 7
 - a. Explain: i) Orbit spacing, ii) Power rating, iii) Bit rate for digital television. (10 Marks)
 - b. Explain in detail very small aperture terminal (VSAT) and its applications. (10 Marks)
- 8

Write short notes on:

 - a. Orbit communication
 - b. Pre-assigned FDMA
 - c. Iridium

(20 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.