

Roll No.

22143

M.E. 1st Semester

(Electronics & Communication Engg.)

Examination – December, 2013

SATELLITE AND SPACE COMMUNICATION

Paper : MEEC-503

Time : Three Hours]

[M.M. : 100

Before answering the question, candidates should ensure that they have been supplied the correct and complete question paper. No complain in this regard, will be entertained after examination.

Note : Attempt any *five* questions out of given *eight*.

1. (a) Mention the advantages of satellite communication over other methods. 6
- (b) Show the importance of 6/4 GHz system. 4
- (c) Why does microwave play an important role in satellite communication. 4
- (d) Make a comparative study of LEO, MEO, GEO and HEO types of satellites. 6

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2. (a) Determine the maximum and minimum range in kilometer from an earth station to a geosynchronous satellite. To what round trip propagation times do these correspond. 10
- (b) Mention the effect of eclipse on the orbital motion of a satellite. 5
- (c) What do you mean by sun-transit outage. ? 5
3. (a) Which is the most popular propellant being used ? 4
- (b) Explain different methods for stabilizing a satellite. 6
- (c) Explain the concepts of frequency reuse. 5
- (d) What do you mean by space qualification ? 5
4. (a) Discuss in detail the factors affecting the link design of a satellite. 10
- (b) Explain what is meant by effective isotropic radiated power ? A transmitter feeds a power of 10 W into an antenna having a gain of 46 dB. Calculate EIRP in (watts) and dBW. 10
5. (a) Why do we require multiplexing of a signal ? 4
- (b) What is energy dispersal ? Discuss its application for satellite communication. 6

(c) Explain the meaning of "noise weighting". 5

(d) Prove that for FM signal : 5

$$\left(\frac{S}{N}\right)_0 = \left(\frac{C}{N}\right)_i \times 3(1+m)m^2$$

6. (a) Derive the output voltage relationship for a QPSK modulator. 10

(b) Explain the concept of coherent and non-coherent detection. 10

7. Compare FDMA, TDMA and CDMA. What is burst plan and mention its method of control. 20

8. (a) Why not SDMA technique can work alone. 6

(b) What is FEC and when it can be used. 6

(c) Explain with block diagram the working of receiver part of earth station. 8