

Roll No.

22143

**M.E. Ist Semester Electronics &
Communication Engg.**

Examination-May, 2014

SATELLITE & SPACE COMMUNICATION

Paper- MEEC-503

Time : 3 hours

Max. Marks : 100

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

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

1. (a) What are the advantages of digital satellite over its analog counterpart ? 6
- (b) Make a comparative study between LEO, MEO, GEO and HEO. 7

- (c) Mention different frequency bands allocated to satellite communication and who are main users of these bands ? 7
2. (a) What is Van Allen belt ? Mention its relationship with satellite communication. 4
- (b) How can Kepler's law of planetary motion be applied to the case of geo-stationary satellite ? 4
- (c) Mention the effect of eclipse on the orbital motion of a satellite. 4
- (d) What do you mean by sun-transit outage ? 4
- (e) What are look angles ? Explain their significance. 4
3. (a) Briefly describe a transponder equipment section. 5
- (b) What do you mean by reliability and redundancy ? How reliability increases through redundancy ? 5

- (c) A dual up-converter comprises of two mixers and two band pass filters with the following specifications: 10

Uplink frequency spectrum = 14 to 14.5 GHz.

First intermediate frequency = 140 MHz

Carrier B.W = 72 MHz

BPF 1 center freq = 1.19 GHz

Determine:

- (a) first local oscillator frequency
- (b) range of second local oscillator frequency
- (c) frequency spectrum of unwanted sideband
- (d) band width of BPF1 and BPF2.

4. (a) Discuss the factors affecting the link design. 7

- (b) What is system noise temperature ? How does it affect C/N and G/T ratios. 7

- (c) Explain what is noise factor ? For what source temperature is noise factor defined ? 6

5. (a) Write short note on telemetry. 10
- (b) Compare QPSK & MSK. 10
6. (a) Compare coherent and non-coherent detection.
- (b) What is Error rate performance ? Explain. 5
- (c) What is analog base band voice signal and why multiplexing is required ? 5
7. Compare TDMA, FDMA & CDMA. What is concept of frequency reuse ? Explain it in all three techniques. 20
8. Write short notes on: 20
- (a) VSAT
- (b) TELSAT
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