

Roll No.

22143

**M. E. 1st Semester (Electronics &
Communication Engg.)**

Examination – January, 2016

SATELLITE AND SPACE COMMUNICATION

Paper : MEEC – 503

Time : Three Hours]

[Maximum 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 examination.

Note : Attempt any five questions. All questions carry equal marks.

1. (a) What do you understand by digital satellite communication ? Discuss advantages of a communication system that uses digital signal transmission. 10
- (b) Prove that for covering the globe, three communication satellite would be sufficient. 10

2. (a) How is uplink link design different than the downlink design ?
 (b) What are orbit parameters required to determine a satellite's orbit ?
3. Write short notes on :
 (i) Ionosphere Scintillation.
 (ii) Free space loss.
4. (a) Describe the telemetry, tracking and command facilities of a satellite communication system. Are they part of space segment or ground segment ?
 (b) What do you mean by error rate performance of a satellite communication system ? How do you calculate the error rate performance for BPSK and DPSK system ?
5. (a) A geostationary satellite is located at a distance of 38000 km with operating frequency 14.25 GHz. The gain of transmitting and receiving antennas are 15 and 20 respectively. If the transmitter power is 200 kW, calculate the power received by receiving antenna.

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- (b) Explain the concept of coherent and non-coherent detection.
6. (a) Describe the operation of typical VSAT user set giving details of outdoor and indoor units.
 (b) What is SPADE ? Explain its operation.
7. (a) Compare the following :
 (i) FDMA with TDMA,
 (ii) OPSK with MSK.
 (b) Derive the output voltage relationship for a OPSK modulator.
8. Write short notes on :
 (i) Link design description of operational in Telesat and INSAT system.
 (ii) SSMA-Base Principles.