

**22143**

**M.E. 1st Semester Electronics and Communication  
Engg. Examination, December-2017**

**SATELLITE AND SPACE COMMUNICATION**

**Paper-MEEC-503**

***Time allowed : 3 hours ] [ Maximum marks : 100***

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

1. (a) Explain frequency allocation and band spectrum for satellite communication system. 10  
(b) Differentiate between active and passive satellite communication systems with their appropriate applications. 10
2. (a) Why uplink frequency is always higher than downlink frequency in satellite communication system ? 10  
(b) Explain and derive the expression for complete link design equation. 10
3. (a) Explain M-ary FSK signal uses in communication systems with its suitable sketch. 10  
(b) A satellite is moving in an elliptical orbit with apogee distance of 35010 km and perigee distance

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22143

of 550 km. Determine the velocity of the satellite at any point in its orbit, if we assume earth radius 6378 km. 10

4. (a) Explain SPC (Single channel per carrier system). 10

(b) Explain the significance of the GMSK modulation technique in communication system. 10

5. (a) Describe various types of antennas used in satellite communication systems. Explain the characteristics and advantages of Cassegrain antenna. 10

(b) A satellite is in a circular equatorial orbit at an altitude of 10000 km from earth's surface. Determine the maximum eclipse time in a day during the full eclipse period by assuming earth radius 6378 km. 10

6. (a) What is error rate performance? Derive the expression for error rate performance of QPSK. 10

(b) Differentiate between various multiple access techniques that are used in satellite communication system. 10

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22143

7. (a) Explain the TDMA frame structure and TDMA Burst structure in detail. 10

(b) Explain in detail the DA-FDMA system in terms of SPADE-frequency plan. 10

8. Write short notes on any two: 20

(a) C/N and G/T ratio

(b) Eclipse effect

(c) Delay transponder.