

Code: EC8T1

IV B.Tech - II Semester – Regular Examinations - April 2016

**SATELLITE COMMUNICATIONS
(ELECTRONICS & COMMUNICATION ENGINEERING)**

Duration: 3 hours

Max. Marks: 70

Answer any FIVE questions. All questions carry equal marks

1.

a) Explain the basic principle of satellite communication with a neat diagram. 7 M

b) List and explain the frequency band allocations used for satellite services. 7 M

2.

a) Explain elevation angle with a neat diagram and derive the expression for it. 7 M

b) A satellite is in an elliptical orbit with a perigee of 1000 km and an apogee of 4000 km. Find the period and eccentricity of the orbit. 7 M

3.

a) What is the necessity of TTC & M system and explain its functioning with a neat diagram. 8 M

b) Write short notes on space qualification in a satellite system.
6 M

4.

a) Derive the expression for C/N ratio of a satellite link. 8 M

b) A satellite at a distance of 40,000 km from a point on the earth's surface radiates a power of 10 W from an antenna with a gain of 17 dB in the direction of the observer. Find the flux density at the receiving point, and the power received by an antenna at this point with an effective area of 10 m^2 . 6 M

5.

a) What is intermodulation in FDMA? Describe the calculation of C/N ratio with intermodulation. 8 M

b) Distinguish between TDMA and FDMA. 6 M

6.

a) Explain the general earth station functionality with the help of a block diagram. 7 M

b) What are the various types of antennas used at earth station? Explain anyone with a neat sketch. 7 M

7.

a) What are the orbit considerations in satellite systems?
Explain. 8 M

b) Compare LEO and MEO orbits. 6 M

8.

a) On what principles the GPS positioning works, explain. 7 M

b) Explain the GPS receiver operation. 7 M