Code No: **RT42043A**   **R13**   Set No. 1

IV B.Tech II Semester Supplementary Examinations, July/August - 2017
SATELLITE COMMUNICATION
(Electronics and Communication Engineering)

Time: 3 hours   Max. Marks: 70

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any THREE questions from Part-B
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PART–A *(22 Marks)*

1. a) What is INTELSAT I? Explain   [3]
    b) What is elevation angle and draw its geometry   [4]
    c) Draw the typical tracking, telemetry, command and monitoring system and explain   [4]
    d) What do you understand by the term 'satellite link'? Explain   [3]
    e) Write about Sun synchronous orbit?   [4]
    f) Draw the simplified GPS receiver and explain?   [4]

PART–B *(3x16 = 48 Marks)*

2. a) Give a brief history of satellite communications   [8]
    b) What are different satellite systems? Explain   [8]

3. a) Draw the geocentric equatorial system and explain the process of locating the satellite with respect to earth [8]
    b) A satellite is in an elliptical orbit with a perigee of 1100 km and an apogee of 4200 km. Using the mean earth radius of 6378.14 km, find the period of the orbit and the eccentricity of the orbit [8]

4. a) What are different antennas used on satellites? Explain with the help of typical satellite antenna patterns and coverage zones [8]
    b) What is reliability? explain and derive expression for average failure rate   [8]

5. a) Draw the TDMA frame structure and explain   [8]
    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. [8]

6. a) Discuss about the primary power test methods used in satellite earth stations?   [8]
    b) Discuss the following NGSO (Non Geo Stationary Orbit) Constellation designs:
        i. Globalstar   ii. Teledesic   [8]

7.   Write short notes on the following:
        a) GPS receiver operation.   [8]
        b) GPS Signal levels.   [8]