(Following Roll No. to be filled by candidate)									

Roll No.

M. TECH.
THIRD SEMESTER THEORY EXAMINATION, 2018-19
DCE-042
SATELLITE COMMUNICATION

Time: 3 Hours **Max. Marks: 100**

Note:

- Attempt all questions. All questions are of equal marks.
- Assume missing data suitably.

1. Attempt any ***Two*** parts of the following: [2×10]
   a. Explain Kepler's law of planetary motion. A satellite is in an elliptical orbit with a perigee of 1000 km and an apoqee of 4000 km having mean earth radius of 6378.14 km. Find the period of the orbit in hours, minutes and seconds and the eccentricity of the orbit.
   b. Explain in brief about launch vehicle. Which factor should be considered at the time of selection of launch vehicle? What are types of satellite launcher? Describe the launch sequence.
   c. (i) Explain look angle in reference to geostationary satellite and earth station.
      (ii) Explain the effect of doppler shift in communication system.

2. Attempt any ***Two*** parts of the following: [2×10]
   a. Discuss the various types of antenna used for satellite broadcasting.
   b. Explain briefly about telemetry tracking, command and monitoring subsystem with the help of block diagram.
   c. Explain the need of altitude and orbit control in satellite.

3. Attempt any ***Two*** parts of the following: [2×10]
   a. Derive a general link design equation. A satellite at a distance of 4000 km from a point on the earth surface radiate a power of 10 W from antenna with a gain of 17 dB in the direction of observer. find the power received by an antenna at the point with effective area $100m^2$. Also find EIRP.
   b. Explain system noise temperature and also derive expression for C/N and G/T ratio.
   c. Explain link budget. What are the parameters that affect the budget?

4. Attempt any ***Two*** parts of the following: [2×10]
   a. Explain TDMA techniques with advantages and disadvantages. Also find the efficiency of TDMA frame.
   b. Describe CDMA. What are the spread spectrum technologies used in satellite communication.
   c. Explain the difference between CDMA, TDMA and FDMA.

5. Write short notes on any ***Four*** of the following: [4×5]
   a. FSS and DBS
   b. RDSS and MSS
   c. Space craft sub system
   d. Earth station sub system
   e. Direct sequence spread spectrum