

Enrollment No: \_\_\_\_\_ Exam Seat No: \_\_\_\_\_

# C.U.SHAH UNIVERSITY

## Summer Examination-2019

**Subject Name: Satellite Communication**

**Subject Code: 4TE06SCM1**

**Branch: B.Tech (EC)**

**Semester: 6**

**Date: 29/04/2019**

**Time: 10:30 To 01:30**

**Marks: 70**

**Instructions:**

- (1) Use of Programmable calculator & any other electronic instrument is prohibited.
  - (2) Instructions written on main answer book are strictly to be obeyed.
  - (3) Draw neat diagrams and figures (if necessary) at right places.
  - (4) Assume suitable data if needed.
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**Q-1 Answer the following questions (14)**

- a) What do you mean by Active satellite?
- b) List out transmission losses.
- c) Define orbital parameters
- d) Define Azimuth angle
- e) Define Elevation angle
- f) What is a regenerative repeater?
- g) What is a payload of a communication satellite?
- h) What are the requirements of an earth station antenna?
- i) What is VSAT?
- j) Define Apogee
- k) Define inclination
- l) Define mean anomaly
- m) Define True anomaly
- n) What is a Yaw?

**Attempt any four questions from Q-2 to Q-8**

**Q-2 Attempt all questions (14)**

- (a) Explain what is meant by satellite attitude and briefly describe two forms of attitude control.
- (b) State and explain Kepler's laws. Give the effects of nonspherical earth.

**Q-3 Attempt all questions (14)**

- (a) Briefly explain Limit of visibility, Near Geostationary Orbits and Launching Orbits.
- (b) What do you mean by earth segment? Explain Transmit-Receive earth stations.

**Q-4 Attempt all questions (14)**

- (a) What is equivalent isotropic Radiated power? Write down Link power budget equation.
- (b) What is meant by Uplink rain fade margin and Down link rain fade margin? Define noise factor.



- Q-5**      **Attempt all questions**      **(14)**
- (a) What do you mean by quantization and modulation? Explain TDMA using a reference station for burst synchronization.
- (b) State all multiple access techniques. Explain any one multiple access technique.
- Q-6**      **Attempt all questions**      **(14)**
- (a) What do you mean by orbital spacing? Write a short note on home receiver outdoor unit
- (b) Discuss in detail about Very Small Aperture Terminal system (VSATs).
- Q-7**      **Attempt all questions**      **(14)**
- (a) Explain cross polarization discrimination. A linearly polarized wave travelling through the ionosphere suffers a faraday rotation of  $9^\circ$ . Calculate polarization loss and cross polarization discrimination.
- (b) Discuss about noise factor and noise figure in detail. An LNA is connected to a receiver which has a noise figure of 12 dB. The gain of LNA is 40 dB and its noise temperature is 120K. Calculate the overall noise temperature referred to the LNA input.
- Q-8**      **Attempt all questions**      **(14)**
- (a) Explain Global Positioning Satellite system
- (b) Explain possible interference modes between satellite circuits and a terrestrial station.

