

# GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER– VII (New) EXAMINATION – WINTER 2019

**Subject Code: 2173207**

**Date: 26/11/2019**

**Subject Name: Satellite Communication & Networking**

**Time: 10:30 AM TO 01:00 PM**

**Total Marks: 70**

**Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1**
- (a) List the orbital elements and explain each of them. **03**
  - (b) Which are the advantages of satellite communication? **04**
  - (c) Explain Kepler's three laws with necessary diagram and equations. **07**
- Q.2**
- (a) Define :(1) Eccentricity (2) Perigee (3) Apogee **03**
  - (b) Describe earth's oblateness, sun & moon's effects on artificial satellite orbit? **04**
  - (c) Calculate the radius of a circular orbit for which the period is 1 day. **07**
- OR**
- (c) An earth station is located at latitude of  $12^\circ$  south and longitude  $52^\circ$  west. Calculate the antenna look angle for a satellite at  $70^\circ$  W. **07**
- Q.3**
- (a) Explain Cross-Polarization Discrimination. **03**
  - (b) What are atmospheric losses? **04**
  - (c) By using of equation and figure properly explain the look angle determination of satellite. **07**
- OR**
- Q.3**
- (a) Explain the phenomenon of scintillation. **03**
  - (b) Differentiate between XPD and Polarization Isolation. **04**
  - (c) Explain what is meant by effective path length in connection with rain attenuation. **07**
- Q.4**
- (a) What is uplink? Draw and explain block diagram. **03**
  - (b) Write a short note on attitude control system. **04**
  - (c) Draw and explain block diagram of telemetry, tracking, command and monitoring system for communication satellite. **07**
- OR**
- Q.4**
- (a) What is downlink? Draw and explain block diagram. **03**
  - (b) Draw block diagram for transmit receive type earth station. **04**
  - (c) Draw and Explain the block diagram of satellite transponder in detail. **07**
- Q.5**
- (a) List the advantage and disadvantage of FDMA multiple access techniques. **03**
  - (b) The uplink C/N0 ratio is 88dBHz and downlink value is 78dBHz. Calculate overall C/N0. **04**
  - (c) Explain asynchronous transfer mode in detail. **07**
- OR**
- Q.5**
- (a) Describe briefly the difference between ATM digital cross connect switch and ATM switch. **03**
  - (b) Explain all the steps to follow for Uplink power budget preparation. **04**
  - (c) Explain block diagram of Code Division multiple Access in detail. **07**

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