

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI(NEW) EXAMINATION – WINTER 2022****Subject Code:3161010****Date:17-12-2022****Subject Name:Satellite Communication****Time:02:30 PM TO 05:00 PM****Total Marks:70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

MARKS

- Q.1** (a) Define following terms: (1) Apogee (2) Perigee (3) Line of apsides **03**
 (b) Draw and explain the block diagram of satellite communication in detail. **04**
 (c) Explain advantages of satellite communication over terrestrial communication. **07**
- Q.2** (a) What is sun synchronous orbit? **03**
 (b) List the orbital elements and explain each of them in detail. **04**
 (c) Explain three laws of Kepler's for planetary motion in detail. **07**
- OR**
- (c) Give comparison of LEO, MEO and GEO satellite orbits and gives application also. **07**
- Q.3** (a) What is station keeping? **03**
 (b) Briefly describe the three-axis method of satellite stabilization. **04**
 (c) Draw and explain block diagram of TT & C system for communication satellite. **07**
- OR**
- Q.3** (a) Give the difference between Attitude control and Orbital Control. **03**
 (b) Write short note on Satellite Antennas. **04**
 (c) Explain Single conversion transponder and Double conversion transponder in detail. **07**
- Q.4** (a) Define following terms. **03**
 (1) Noise factor (2) Noise Temperature (3) Carrier to Noise ratio
 (b) Explain various uplink path losses in satellite communication. **04**
 (c) Explain how to compute uplink and downlink C/N ratios for a typical satellite link. **07**
- OR**
- Q.4** (a) What is EIRP? Show the relationship between Power flux density and EIRP. **03**
 (b) Derive Friis transmission equation for received power in any radio link. **04**
 (c) Define Downlink. Draw a pictorial representation of a Downlink. Show the power budget calculations for a downlink path. **07**
- Q.5** (a) What is CBTR (Carrier and bit time recovery)? **03**
 (b) List the advantage and disadvantage of FDMA, TDMA and CDMA. **04**
 (c) Explain briefly code division multiple access. **07**
- OR**
- Q.5** (a) Compare FDM/FM-FDMA and SCPC-FDMA **03**

- (b) Give the difference between Multiplexing techniques and Multiple access techniques. **04**
- (c) Explain the SPADE system. **07**
