

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI (NEW) EXAMINATION – SUMMER 2023****Subject Code:3161010****Date:14-07-2023****Subject Name:Satellite Communication****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.
4. Simple and non-programmable scientific calculators are allowed.

		MARKS
Q.1	(a) What are the advantages of satellite communication?	03
	(b) Explain the architecture of a satellite communication system.	04
	(c) Compare and contrast the different frequency bands used for satellite communication and their applications.	07
Q.2	(a) What is the difference between a solar day and a sidereal day?	03
	(b) Define Inclination, Prograde orbit, Argument of perigee, Right ascension of ascending node.	04
	(c) State Kepler's three laws of planetary motion with figures and equations.	07
OR		
	(c) Explain the concept of a geostationary orbit and its significance in satellite communication.	07
Q.3	(a) What is the purpose of the attitude and orbit control system in a satellite?	03
	(b) Discuss the functions of the Telemetry, Tracking, Command and Monitoring (TTC&M) subsystem in a satellite.	04
	(c) Analyze the power sub-system of a satellite and explain the methods used for power generation and storage in a satellite.	07
OR		
Q.3	(a) What is the sun transit outage phenomenon and its effect on satellite communication?	03
	(b) Briefly describe the three-axis method of satellite stabilization.	04
	(c) Explain the block diagram of Satellite Transponder. Also explain the frequency reuse technique for Transponder.	07
Q.4	(a) What is a satellite link budget in satellite communication?	03
	(b) Explain the received signal power equation used in satellite link budget calculations.	04
	(c) Discuss the advantages and disadvantages of each multiple access scheme, and suggest situations where each would be most appropriate in satellite communication.	07

OR

- Q.4** (a) What is the meaning of multiple access? **03**
(b) What is meant by space division multiple access? **04**
(c) List the types of Multiple Access Scheme used in the satellite communication and give its comparisons. **07**
- Q.5** (a) What is SCPC? **03**
(b) Analyze the time division multiple access (TDMA) technique used in satellite communication and discuss its applications. **04**
(c) Discuss the impact of weather conditions on the satellite link budget and C/N ratio calculations. **07**
- OR**
- Q.5** (a) Discuss the applications of satellite communication in military, broadcast, and remote sensing. **03**
(b) Describe the brief history of satellite systems in satellite communication. **04**
(c) Analyze the impact of satellite communication on global communication systems and the future prospects of the technology. **07**
