

GUJARAT TECHNOLOGICAL UNIVERSITY**BE- SEMESTER- VII EXAMINATION – SUMMER 2026****Subject Code:3173207****Date:20-05-2026****Subject Name: Satellite Communication and Networking****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) Describe the following terms of Earth orbiting satellites (1) Ascending node (2) line of apsides (3) Retrograde orbit	03
	(b) Explain Elevation angle and Azimuth angle calculation with necessary Equation.	04
	(c) What are Kepler's three laws of planetary motion? Give the mathematical formulation of Kepler's third law of planetary motion.	07
Q.2	(a) Write a short note on Receive-Only Home TV Systems.	03
	(b) A satellite is in an elliptical orbit with a perigee of 1000 km and an apogee of 4000 km using mean earth radius of 6378.14 km, find the period of the orbit in hours, minutes, and seconds, and the eccentricity of the orbit.	04
	(c) Explain how to compute uplink and downlink C/N ratio for a typical satellite link.	07
	OR	
	(c) Explain the block diagram of Satellite Transponder. Also explain the frequency reuse technique for Transponder.	07
Q.3	(a) Define :(1) Eccentricity (2) Perigee (3) Apogee	03
	(b) Differentiate between XPD and Polarization Isolation.	04
	(c) What is Satellite communication? Draw and Explain the block diagram of Satellite Communication in detail.	07
	OR	
Q.3	(a) What are the advantages of Satellite Communication?	03
	(b) What are atmospheric losses?	04
	(c) Write a short note on the solar eclipse of satellite and sun transit outage.	07
Q.4	(a) A geostationary satellite is located at 90° W. Calculate the azimuth angle for an earth station antenna at latitude 35° N and longitude 100° W.	03
	(b) Write a Short note on Atmospheric Drag.	04
	(c) What is the purpose of Telemetry, Tracking, Command in satellite communication? Explain in detail.	07
	OR	
Q.4	(a) Define Input Back-off and Output Back-off.	03
	(b) Discuss three-axis method of Satellite Stabilization.	04

	(c)	Explain asynchronous transfer mode in detail.	07
Q.5	(a)	List the advantage and disadvantage of TDMA.	03
	(b)	What is meant by rain attenuation? Derive an equation for the same.	04
	(c)	Explain Code Division Multiple Access in detail.	07
OR			
Q.5	(a)	Discuss Antenna Misalignment Losses.	03
	(b)	Draw block diagram for transmit receive type earth station.	04
	(c)	Write short notes on Demand Access Multiple Access system.	07