

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER-VII EXAMINATION – WINTER 2025

Subject Code: 3173207

Date:13-11-2025

Subject Name: Satellite Communication and 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.
4. Simple and non-programmable scientific calculators are allowed.

MARKS

Q.1	(a) Define (1) Apogee (2) Perigee (3) Subsatellite Path.	03
	(b) Define Earth Eclipse of Satellite.	04
	(c) Briefly describe the three-axis method of satellite stabilization.	07
Q.2	(a) Write short notes on satellite antennas.	03
	(b) With necessary equation and diagram, explain limits of visibility.	04
	(c) What is Kepler's three laws of planetary motion? Give the mathematical formulation of Kepler's third law of planetary motion	07
	OR	
	(c) What is the purpose of telemetry, tracking, command, and monitoring in satellite communication? Explain in detail	07
Q.3	(a) What are the advantages of satellite communication compared to traditional wired communication?	03
	(b) Differentiate XPD and Polarization isolation.	04
	(c) Write a short note on ATM in satellite communication.	07
	OR	
Q.3	(a) Define the Sun Transit Outage.	03
	(b) Explain Spade System.	04
	(c) Calculate the radius of a circular orbit for which the period is 1 day.	07
Q.4	(a) Define Input Back-off and Output Back-off.	03
	(b) Calculate overall C/N ₀ for uplink and downlink C/N ₀ ratio of 46dB.	04
	(c) Explain asynchronous transfer mode in detail.	07
	OR	
Q.4	(a) Write differences between: Attitude control and orbital control?	03
	(b) What is Free space loss? The range between a ground station and a satellite is 42,000 km. Calculate the free-space loss at a frequency of 6 GHz.	04
	(c) Identify and compare multiple access schemes used in satellite communication.	07
Q.5	(a) Discuss Antenna Misalignment Losses.	03
	(b) Write a short note on Atmospheric Drag.	04
	(c) Write a short note on TCP link.	07
	OR	
Q.5	(a) Write a short note on Master Antenna TV Systems.	03
	(b) Write a note on Rain depolarization.	04
	(c) Explain how to compute uplink and downlink C/N ratio for a typical satellite link.	07
