Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI (NEW) EXAMINATION – SUMMER 2022

Subject Code:3161010 Date:10/06/2022

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.**

Q.1	**(a)**	Define (1) Apogee (2) Perigee (3) Subsetellite Path	**03**
	(b)	State Kepler's three laws of planetary motion.	**04**
	(c)	Explain various frequency bands used for satellite communication.	**07**
Q.2	**(a)**	Define Earth Eclipse of Satellite.	**03**
	(b)	Explain Attitude & Orbit Control system (AOCS).	**04**
	(c)	Draw and Explain block diagram of TTC & M system.	**07**
		OR	
	(c)	Briefly describe the Three axis method of satellite stabilization.	**07**
Q.3	**(a)**	Define the terms Roll, pitch and yaw.	**03**
	(b)	Explain the Effect of a nonspherical earth on orbital path of satellite.	**04**
	(c)	Draw & Explain block diagram of Transponder.	**07**
		OR	
Q.3	**(a)**	Define the following : (1) Atmospheric drag. (2) Doppler Shift.	**03**
	(b)	Explain what is meant by EIRP.	**04**
	(c)	What is the advantage of TWTA used aboard the satellites.	**07**
Q.4	**(a)**	Calculate the radius of a circular orbit for which the period is 1 day.	**03**
	(b)	Derive Friis transmission equation for received power in any radio link.	**04**
	(c)	Compare FDMA, TDMA and CDMA techniques.	**07**
		OR	
Q.4	**(a)**	Define elevation angle and azimuth angle.	**03**
	(b)	A geostationary satellite is located at 90^0 W. Calculate the azimuth angle for an earth-station antenna at latitude 35^0 N and longitude 100^0 W.	**04**
	(c)	Discuss the various design issues related with uplink design and give the Expression C/N ratio for the same.	**07**
Q.5	**(a)**	What is Demand Assigned FDMA.	**03**
	(b)	Explain Noise Power Calculation in Satellite Link Budget.	**04**
	(c)	Explain Sun transit outage phenomena.	**07**
		OR	
Q.5	**(a)**	What is SPADE System in channeling scheme.	**03**
	(b)	Explain Various modulation schemes used in satellite communication.	**04**
	(c)	Explain C/N ratio calculations in clean air and rainy conditions.	**07**

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