Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. - SEMESTER – II • EXAMINATION – SUMMER • 2014

Subject code: 1710418 **Date: 01-07-2014**

Subject Name: Satellite Communication

Time: 02:30 pm - 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.**

Q.1 **(a)** Explain Following terms with necessary diagram with respect to Satellite Communication System. **07**

1. Inclination
2. Prograde Orbit
3. Retrograde Orbit
4. Argument of perigee
5. Line of Apsides
6. Mean anomaly
7. True Anomaly

(b) An earth station is located at latitude 12^0 S and longitude 52^0 W calculate antenna look angle for a satellite at 70^0 W. **07**

Q.2 **(a)** Describe TT&C facilities of Satellite Communication System. Is this a part of Space segment or Ground segment? **07**

(b) Describe E-W & N-S station-keeping maneuvers required in satellite station keeping. **07**

OR

(b) What do you mean by attitude Control? Explain one method each used for passive attitude control and active attitude control. **07**

Q.3 **(a)** Explain Transmission losses with necessary equation related to space link. **07**

(b) In Link budget calculation at 12GHz consider following data. **07**

[EIRP]	48dbW
[G/T]	19.5db/k
[FSL]	206
[RFL]	1db
Atmospheric absorption	2db
Antenna pointing loss	1db

Calculate [C/No] carrier to noise spectral density ratio.

OR

Q.3 **(a)** Why LNA of receiving system is Placed at antenna end of feeder Cable. **07**

(b) Explain input back off and output back off for satellite TWT amplifier. **07**

Q.4 **(a)** Explain in detail the operation of spade system of demand assignment. What is the function of common signaling channel? **07**

(b) The desired carrier EIRP from a satellite is 34dbW and ground station receiving antenna gain is 44db in the desired direction and 24.47 dB toward the interfering satellite. The interfacing satellite also radiates an EIRP of 34dbW. The polarization discrimination is 4db.determine the C/I ratio at ground receiving antenna. **07**

OR

Q.4 **(a)** Describe on board signal processing for FDMA / TDMA operation. **07**

	(b)	Explain working of transponder with the help of Block diagram showing different subsystem and approximate RF levels.	**07**
Q.5	**(a)**	Explain reference burst in TDMA system and calculate the frame efficiency for INTELSAT frame for given following data. Total frame length 120832 symbols Traffic bursts per frame 14 Reference bursts per frame 2 Guard interval 103 symbols	**07**
	(b)	Explain network synchronization in TDMA.	**07**

OR

Q.5	**(a)**	Explain pre assigned FDMA and demand assigned FDMA.	**07**
	(b)	What is the function of Unique word with respect to TDMA? Explain unique word detection with the help of necessary diagram.	**07**

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