Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII • EXAMINATION – WINTER • 2014

Subject Code: 171007 **Date: 29-11-2014**

Subject Name: Satellite Communication

Time: 10:30 am - 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.**

Q.1	**(a)**	Explain different Satellite services. What is footprint? What is the difference between polar orbit and geostationary orbit?	**07**
	(b)	Calculate the radius of a circular orbit for which the period is one day.	**07**
Q.2	**(a)**	An earth station is located at latitude 30°S and longitude 130°E. Calculate the antenna-look angles for a satellite at 156°E.	**07**
	(b)	Determine the angle of tilt required for a polar mount used with an earth station at latitude 49° north. Assume a spherical earth of mean radius 6371 km, and ignore earth-station altitude.	**07**
		OR	
	(b)	An antenna has a noise temperature of 35 K and is matched into a receiver which has a noise temperature of 100 K. Calculate (i) the noise power density and (ii) the noise power for a bandwidth of 36 MHz.	**07**
Q.3	**(a)**	Write a short note on Equipment reliability and space qualification for Satellite Communication.	**07**
	(b)	Draw and explain TT&C.	**07**
		OR	
Q.3	**(a)**	Explain the block diagram of Satellite Transponder. Also explain the frequency reuse technique for Transponder.	**07**
	(b)	Explain Cross-Polarization Discrimination.	**07**
Q.4	**(a)**	How the error control done in Digital DBS-TV? Explain it.	**07**
	(b)	Explain Orbit Consideration with respect to Non-Geostationary Satellite Orbit (NGSO).	**07**
		OR	
Q.4	**(a)**	What is VSAT ? List the application of VSAT. Also Draw and explain the architecture of VSAT system.	**07**
	(b)	Write short notes on Master Control Station required for Direct Broadcast Satellite Television (DBS-TV) system.	**07**
Q.5	**(a)**	Explain how to compute uplink and downlink C/N ratios for a typical satellite link.	**07**
	(b)	Write differences between: (i) Attitude control and orbital control (ii) East west and north south station keeping maneuvers.	**07**
		OR	
Q.5	**(a)**	Explain the spade system.	**07**
	(b)	Explain GPS receiver operation in short.	**07**

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