Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

PDDC - SEMESTER–VII EXAMINATION – WINTER 2015

Subject Code:X71104 **Date:04/12/2015**

Subject Name: Satellite communication

Time: 10:30pm to 01:00pm **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)**	State and explain Kepler's three laws of planetary motion.	**07**
	(b)	Explain different types of orbits used for satellite communication	**07**
Q.2	**(a)**	Explain following terms related to satellite communication.	**07**
	(b)	(i)Apogee (ii)Perigee (iii)Sub satellite path (iv)Line of apsides (v)Ascending node (vi)Descending node (vii)Inclination .	**07**
		OR	
	(b)	Explain the functions of TT&C Subsystem using neat and clean figure.	**07**
Q.3	**(a)**	Explain (i)Antenna look angles (ii)Attitude control	**07**
	(b)	Determine the angle of tilt required for a polar mount used with an earth station at latitude 49^0 north. Assume a spherical earth of mean radius 6371 km, and ignore earth station altitude.	**07**
		OR	
Q.3	**(a)**	What is VSAT? List the application of VSAT. Also draw and explain the architecture of VSAT system.	**07**
	(b)	A geostationary satellite is located at 90^0W. Calculate the azimuth angle for an earth station antenna at latitude 35^0N and longitude 100^0.	**07**
Q.4	**(a)**	List the advantages and disadvantages of FDMA , TDMA and CDMA multiple access techniques.	**07**
	(b)	Explain different types of antennas used in satellite communication system.	**07**
		OR	
Q.4	**(a)**	Calculate the radius of a circular orbit for which the period is 1 day.	**07**
	(b)	Explain (i) Sun transit outage (ii) Earth eclipse of satellite and (iii)Limits of visibility.	**07**
Q.5	**(a)**	What is uplink? Draw and explain uplink block diagram. Also explain all the steps to be followed for uplink power budget preparation.	**07**
	(b)	A Satellite at a distance of 40000 km from a point on the earth's surface radiates a power of 10 watts from an antenna with a gain of 17 dB in the direction of the observer. Find the flux density at the receiving point, and the power received by an antenna at this point with an effective area of 10 m^2.	**07**
		OR	
Q.5	**(a)**	What is GPS? Explain principle of GPS position location. Also explain signal generation in GPS.	**07**
	(b)	Explain What is XPD? How XPD are predicted? Also draw and explain the Canting angle and Tilt angle.	**07**

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