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## **GUJARAT TECHNOLOGICAL UNIVERSITY**

**BE - SEMESTER-VII • EXAMINATION - SUMMER • 2015** 

		oject Code: 171007 Date:06/05/2015	
		ject Name: Satellite communication	
		ne: 02.30pm-05.00pm Total Marks: 70	
	Instr	ructions: 1. Attempt all questions.	
		<ol> <li>Attempt an questions.</li> <li>Make suitable assumptions wherever necessary.</li> <li>Figures to the right indicate full marks.</li> </ol>	
Q.1	(a)	List the orbital elements and explain each of them in detail. Also give their significance in orbital maintenance.	07
	<b>(b)</b>	Describe the earth's oblateness, sun and moon's effects on artificial satellite's orbit?	07
Q.2	(a)	A satellite is in an elliptical orbit with a perigee of 1000 km and an apogee of 4000 km. using mean earth radius of 6378.14 km, find the period of the orbit in hours, minutes, and seconds, and the eccentricity of the orbit.	07
	<b>(b)</b>	List various types of control required to maintain the satellite in space and explain attitude and orbital control system in detail.	0′
	<b>(3.</b> )	OR	
	<b>(b)</b>	List the types of parameter effective in downlink of satellite. Also give its significance and arrange them in the equation for downlink.	07
Q.3	(a)	What is the purpose of Telemetry, Tracking, Command, and Monitoring in satellite	07
	<b>(b)</b>	communication? Explain in detail.  Give the list of all Multiple Access System used for satellite communication. Explain any one of them in detail and give comparison of any three.	07
Q.3	(a) (b)	An earth station situated in the U.K. needs to calculate the Look angles to a geostationary satellite in the Indian ocean operated at INSAT. The details of the earth station site and the satellite are as follows:  Earth station latitude and Longitude are 52.0° N and 0°  Satellite longitude (subsatellite point) is 66.0° E  The parameter that effect the selection of satellite launch vehicle.	07
<b>Q.4</b>	(a)	List the types of propagation effect that can provide impact on satellite – earth link and	0′
<b>C</b>	()	explain any two of them.	
	(b)	An earth station have equivalent noise temperature of 2000 K, noise bandwidth of 18 MHz, antenna gain of 50dB and carrier frequency of 12 GHz Determine, Gain to Equivalent Noise temperature ratio, Noise density, and Total Noise Power.  OR	07
<b>Q.4</b>	(a)	Write short notes on Access Control Protocols used in VSAT network.	0
	<b>(b)</b>	What is GPS? Draw and explain the block diagram of the GPS receiver with all detail.	07
Q.5	(a)	Write short notes on Master Control Station required for Direct Broadcast Satellite Television (DBS-TV) system.	07
	<b>(b)</b>	Draw and Explain the block diagram of satellite transponder in detail.  OR	0'
Q.5	(a)	The uplink $C/N_0$ ratio is 88 dBHz and downlink value is 78 dBHz. Calculate overall $C/N_0$ .	07
	<b>(b)</b>	Describe XPD. How XPD are predicted? Also Draw and Explain properly The Canting Angle and Tilt Angle with required equations.  ***********************************	07