Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME - SEMESTER– II (Old course)• REMEDIAL EXAMINATION – SUMMER 2015

Subject Code: 1710418 **Date:14/05/2015**

Subject Name: Satellite Communication

Time: 02:30 pm to 5:00 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)**	Describe the TT&C facilities of a satellite communications system.	**07**
	(b)	State Keplerôs law of planetary motion. What is Keplerôs constant ? Derive the equation for orbital period of satellite.	**07**
Q.2	**(a)**	Briefly discuss the phenomenon of eclipse due to earth as applied to a geostationary satellite and solar interference at earth station	**07**
	(b)	Discuss importance of noise figure and noise temperature in context with satellite communication.	**07**
		OR	
	(b)	Describe and compare MATV and CATV in detail.	**07**
Q.3	**(a)**	Explain input and output back off in power amplifier.	**07**
	(b)	Explain what is meant by thermal control and why this is necessary in a satellite.	**07**
		OR	
Q.3	**(a)**	Describe in detail three axis method of satellite stabilization.	**07**
	(b)	Explain briefly (i) Pre assigned FDMA (ii) Demand assigned FDMA	**07**
Q.4	**(a)**	With the aid of the block schematic briefly describe the outdoor and indoor unit in a home terminals DBS TV receiving system. Why LNA subsystem is placed at the antenna end of the feeder cable.	**07**
	(b)	Describe on board signal processing for FDMA/TDM operations.	**07**
		OR	
Q.4	**(a)**	What is the function of Unique Word with respect to TDMA? Explain unique word detection circuit with the help of block schematic.	**07**
	(b)	Explain in detail the operation of SPADE system. What is function of common signaling channel?	**07**
Q.5	**(a)**	Explain working of transponder with the help of block diagram showing different subsystem and approximate RF levels.	**07**
	(b)	An LNA is connected with a receiver which has a noise figure of 12 dB. The gain of LNA is 40 dB , and its noise temperature is 120K. Calculate overall noise temperature referred to LNA input.	**07**
		OR	
Q.5	**(a)**	Explain in detail Transmission Losses.	**07**
	(b)	An uplink operates at 14GHz, and the flux density required to saturate the transponder is -120 dB (W/m^2). The free space loss is 207dB and the other propagation losses amount is 2 dB. Calculate the earth station EIRP required for saturation in clear sky condition. Assume RFL is negligible.	**07**

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