Seat No.:	Enrolment No

Subject Name: SATELLITE COMMUNICATION

Subject Code:X71104

GUJARAT TECHNOLOGICAL UNIVERSITY PDDC SEMESTER VII- EXAMINATION - SUMMER 2017

Date: 03/05/2017

Time: 02.30PM to 05.00PM **Total Marks: 70 Instructions:** 1. Attempt all questions. 2. Make suitable assumptions wherever necessary. 3. Figures to the right indicate full marks. 0.1 (a) Explain with suitable expression why satellite remains stable in the orbit around the 07 List out the types of orbit according to the altitude of the orbit. Discuss any three in 07 **(b)** details. **Q.2** (a) What is satellite attitude? Explain briefly two forms of attitude control. 07 A satellite is in a circular orbit around the earth. The altitude of a satellite's orbit above 07 the surface of the earth is 1400 Km. What are the centripetal and centrifugal accelerations acting on the satellite? What is the velocity of the satellite in the orbit? (km/s) 3. What is the orbital period of satellite? (hr min sec) **(h)** Write short notes on Equipment Reliability and Space qualification. 07 Explain Earth Eclipse. What position of satellite is preferable to operate during eclipse? 0.3 07 Define the following with suitable figure: 07 Right ascension of ascending node Argument of perigee 3. True anomaly 4. One Solar day 5. Line of apsides \mathbf{OR} 0.3 What is the earth's oblateness, sun and moon's effects on satellite's orbit? 07 (a) The state of Virginia may be represented roughly as a rectangle bounded by 39.5° N 07 latitude on the north, 36.50 N latitude on the south, 76.00 W longitudes on the east and 86.30 W longitudes on the west. If a geostationary satellite must be visible throughout Virginia at an elevation angle no lower than 20°, what is the range of longitudes within which the sub satellite point of the satellite must lie? What are the various losses that may affect the satellite link performance 07 0.4 (a) Determine the carrier-to-noise density ratio at the satellite input for an uplink, which has 07 the following parameters: operating frequency 6 GHz, saturation flux density: -95dBW/m2, input BO 11 dB, satellite [G/T]: -7dBK⁻¹, [RFL] 0.5 db. Tabulate the link budget values. OR Write short note on SPADE System. 07 **Q.4** (a) Compare FDMA, TDMA and CDMA modulation techniques for satellite 07 **(b)** communication. Write a short note on VSAT. 0.5 (a) 07 Explain the working of GPS system. 07 **(b)** OR Draw the block diagram of TV transmitter or receiver. Explain the error controlling **07** Q.5 (a) techniques used for delivering an error free signal at the terminal. **(b)** What is the difference between MATV and CATV? **07**