

GUJARAT TECHNOLOGICAL UNIVERSITY**BE- VIIth SEMESTER-EXAMINATION – MAY/JUNE- 2012****Subject code: 171007****Date: 29/05/2012****Subject Name: Satellite Communication****Time: 02:30 pm – 05:00 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) Give Comparison of LEO, MEO and GEO satellite orbits and gives application also. **07**
- (b) List the orbital elements and explain each of them in detail. Also give their significance in orbital maintenance. **07**

- Q.2** (a) List various types of control required to maintain the satellite in space and explain attitude and orbital control system in detail. **07**
- (b) What is uplink? Draw and Explain Uplink block-diagram. Also explain all the steps to followed for Uplink power budget preparation. **07**

OR

- (b) 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) What is XPD ? properly explain. How XPD are predicted ? Also Draw and Explain properly The Canting Angle and Tilt Angle with required equations. **07**
- (b) Determine the visibility of a earth station situated at mean sea level at latitude of 48.42° north and longitude 89.26° west. Assume a minimum angle of elevation of 5° . **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 earth station have equivalent noise temperature of 200°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. **07**

- Q.4** (a) List Five major types of orbits and explain any two of them in detail. **07**
- (b) The uplink C/N_0 ratio is 88dBHz and downlink value is 78dBHz. Calculate overall C/N_0 . **07**

OR

- Q.4** (a) List all seven operational NGSO constellation design and explain any two of them in detail. **07**
- (b) In a TDMA system transmission rate is 60 Mbps, Voice channel bit rate is 64 Mbps Number of burst/ frame are 10, number of bits in a preamble are 150. frame time 750 μsec . Find Noise channel capacity. **07**

- Q.5** (a) What is GPS ? Explain principle of GPS position location. Also explain signal generation in GPS. **07**
- (b) Draw and Explain the block diagram of satellite transponder in detail **07**

OR

- Q.5** (a) List all propagation effects which are not associated with hydrometer and explain them **07**
- (b) Give all the steps to launch the satellite vehicles for geostationary orbits and explain it with required figure and equations. **07**
