

**GUJARAT TECHNOLOGICAL UNIVERSITY****ME – SEMESTER – II (New)– EXAMINATION – WINTER-2019****Subject Code: 3720506****Date: 21-11-2019****Subject Name: Satellite Communication****Time: 02:30 PM TO 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) Explain Kepler's three laws of planetary motion. Define orbital terms: Apogee, Perigee, Ascending node, Descending node. **07**
- (b) Explain effect of earth eclipse of satellite. Define sun transit outage and range variation. **07**
- Q.2** (a) Explain types of orbit. Explain difference between geostationary and geosynchronous orbit. **07**
- (b) Explain rain attenuation, atmospheric losses and ionosphere effect for satellite communication. **07**
- OR**
- (b) Draw and explain TT and C. **07**
- Q.3** (a) Explain attitude and orbit control. Explain spin stabilization. **07**
- (b) (1) Explain power system of satellite system. **03**
- (2) Explain station keeping. **04**
- OR**
- Q.3** (a) An uplink operates at 14 GHz, and the flux density required to saturate the transponder is  $-120\text{dB (W/m}^2\text{)}$ . The free space loss is 207 dB, and the other propagation losses amount to be 2 dB. An input BO is of 11 dB, [RFL] is of 0.6 dB. The satellite [G/T] is of  $-6.7\text{dB/K}$ . Calculate the earth station [EIRP] required for saturation, Calculate the carrier to noise density ratio. Assume clear sky conditions. **07**
- (b) Explain combined uplink and downlink C/N ratio with its power flow diagram. **07**
- Q.4** (a) Explain TDMA using reference station for burst synchronization. Explain basic principles of burst transmission for a single channel. **07**
- (b) Compare pre assigned FDMA and Demand assigned FDMA. **07**
- OR**
- Q.4** (a) Explain the spade system. **07**
- (b) Explain Transmit Receive Earth station. **07**
- Q.5** (a) Draw and explain digital DBS TV in detail. **07**
- (b) Explain GPS in detail. **07**
- OR**
- Q.5** (a) Explain VSAT and its application. **07**
- (b) Write on Satellite Mobile services. **07**

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