

GUJARAT TECHNOLOGICAL UNIVERSITY**BE- SEMESTER-VII (NEW) EXAMINATION – WINTER 2020****Subject Code:2171007****Date:21/01/2021****Subject Name:Satellite Communication****Time:10:30 AM TO 12:30 PM****Total Marks: 56****Instructions:**

1. Attempt any **FOUR** questions out of **EIGHT** questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) Explain what is meant by (a) line of apsides and (b) line of nodes. Is it possible for these two lines to be coincident? **03**
- (b) Draw and explain the block diagram of satellite communication in detail. **04**
- (c) Explain Kepler's three law of planetary motion with require expression. **07**
- Q.2** (a) Explain atmospheric losses for radio wave propagation. **03**
- (b) Determine the angle of tilt required for a polar mount used with an earth station at latitude 49° north. Assume a spherical earth of mean radius 6371 km, and ignore earth-station altitude. **04**
- (c) By using of equation and figure properly explain the look angle determination of satellite. **07**
- Q.3** (a) Define and Explain the terms roll, pitch and yaw. **03**
- (b) Write difference between attitude control and orbital control. **04**
- (c) Draw and explain the block diagram of satellite transponder in detail. **07**
- Q.4** (a) Explain what is meant by polarization interleaving. **03**
- (b) Write difference between east-west and north-south station keeping maneuvers. **04**
- (c) Write a short note on receive-only home TV system. **07**
- Q.5** (a) Explain what is meant by the term redundant earth station? **03**
- (b) The uplink C/N_0 ratio is 88 dBHz and downlink value is 78 dBHz. Calculate overall C/N_0 ratio. **04**
- (c) What do you mean by multiple access technique? Explain time division multiple access in detail. **07**
- Q.6** (a) State the type of satellite antenna normally used to produce a wide beam radiation pattern, providing global coverage. How are spot beams produced? **03**
- (b) Explain how to compute uplink and downlink C/N ratios for a typical satellite link. **04**
- (c) Define downlink. Draw a pictorial representation of a downlink. Show the power budget calculation for a downlink path. **07**
- Q.7** (a) How GPS works? **03**
- (b) Compare Preassigned FDMA and Demand assigned FDMA. **04**
- (c) Write short note on master control station required for direct broadcast satellite television (DSB-TV) system. **07**

- Q.8** (a) What is VSAT? **03**
(b) How is error control achieved in Digital DSB TV? **04**
(c) Describe Iridium and Orbcomm satellite systems in detail. **07**

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