

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI (NEW) EXAMINATION – WINTER 2023****Subject Code:3161010****Date:13-12-2023****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.
4. Simple and non-programmable scientific calculators are allowed.

- Q.1** (a) Describe polar orbiting satellites with figure. **03**
 (b) Describe briefly any four services provided by satellite **04**
 (c) Define: (1) Kepler's first law with figure. **07**
 (2) Kepler's Second law with figure.

- Q.2** (a) Describe Kepler's Third law. **03**
 (b) Define: (1) subsatellite path. **04**
 (2) Apogee
 (3) Perigee
 (4) Line of apsides
 (c) Explain Orbit perturbations and Effects of a nonspherical earth With necessary equations. **07**

OR

- (c) Explain earth eclipse of satellite with figure. **07**
Q.3 (a) What are the conditions required for an orbit to be geostationary? **03**
 (b) Explain limits of visibility with figure. **04**
 (c) Describe with figure: The attitude control in detail. **07**

OR

- Q.3** (a) What do you mean by near geostationary orbit? **03**
 (b) Explain the term: Station keeping. **04**
 (c) With diagram Explain the TT&C Subsystem in detail. **07**
Q.4 (a) Explain sun Transit outage. **03**
 (b) Calculate the apogee and Perigee heights for the orbital parameters $e=0.0011501$, $a=7192.335$ km and mean earth radius=6371 km. **04**
 (c) Derive the equation for Carrier to Noise ratio(C/N_o) at receiver input. **07**

OR

- Q.4** (a) Define: (1) Ascending node **03**
 (2) descending node
 (3) Line of Nodes.
 (b) Define Equivalent Isotropic Radiated Power (EIRP) with equation. **04**
 (c) Describe preassigned FDMA with diagram. **07**
Q.5 (a) Explain Demand assigned FDMA. **03**
 (b) What is link power budget equation? Explain briefly. **04**
 (c) Describe the Noise temperature of absorptive networks with necessary equations and derive the equation for Overall system noise temperature. **07**

OR

- Q.5** (a) Describe: Demand assigned TDMA. **03**
 (b) With diagram explain the function a basic CDMA system. **04**
 (c) Describe: Preassigned TDMA with figures. **07**
