

GUJARAT TECHNOLOGICAL UNIVERSITY**M. E. IST Semester–Remedial Examination – July- 2011****Subject code: 710418****Subject Name: Satellite Communication****Date:15/07/2011****Time: 10:30 am – 01:00 pm****Total Marks: 60****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 first, second and third law in detail. **06**
(b) Define: (1) Apogee **06**
(2) Perigee
(3) Line of apsides
(4) Ascending node
(5) Descending node
(6) Line of nodes
(7) Inclination
- Q.2** (a) Define: (1) Suntransit outage **06**
(2) Earth eclipse of satellite
(3) Near geostationary orbits
(b) Describe with neat figures: Antenna look angles. **06**
- OR**
- (b) Determine the limits of visibility for an earth station situated at mean sea level at altitude 48.42 degrees North and longitude 89.26 degrees west. Assume a minimum angle of elevation of 5 Degree. **06**
- Q.3** (a) Explain: (1) attitude control. **06**
(2) Station keeping.
(3) Spinning satellite stabilization
(b) Explain the functions of TT&C subsystems in detail. **06**
- OR**
- Q.3** (a) Draw the block diagram showing a home terminal for DBS TV/FM reception and explain the function of each block . **06**
(b) Draw one possible arrangement for a master antenna TV(MATV) system and explain its operation in detail. **06**
- Q.4** (a) Draw more detailed diagram of a Transmit -Receive Earth station & explain its functioning in detail . **06**
(b) (1) A satellite down link at 12 GHz operates with a transmit power of 6W and an antenna gain of 48.2dB calculate the EIRP in dB W **06**
(2) Calculate the gain of a 3 m paraboloidal antenna operating at a frequency 12Ghz. Assume an aperture efficiency of 0.55
- OR**
- Q.4** (a) With necessary equations describe transmission losses in detail. **06**

- Q.4 (b)** (1) The range Between a ground station and a satellite is 42000 km . **06**
 Calculate the free space loss at a frequency of 6 Ghz.
 (2) An antenna has a noise temperature of 35 K and is matched into a receiver which has a noise temperature of 100 K. Calculate (i) The noise power density (ii) The noise power for a band width of 36 MHz.
- Q.5 (a)** Explain briefly: (1) Preassigned FDMA **06**
 (2) Demand assigned FDMA
- (b)** Draw diagrammatic representation of a SPADE communication system and explain its functioning. **06**
- OR**
- Q.5 (a)** With diagram explain the functioning of a satellite switched TDMA. **06**
(b) Define: (1) Prograde orbit **06**
 (2) Retrograde orbit
 (3) Argument of perigee
 (4) Mean anomaly
 (5) True anomaly
 (6) Bary center
 (7) Eccentricity
- *****