

GUJARAT TECHNOLOGICAL UNIVERSITY**M. E. - SEMESTER – I • EXAMINATION – WINTER • 2013****Subject code: 710418N****Date: 01-01-2014****Subject Name: Satellite Communication****Time: 10.30 am – 01.00 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) With the aid of the block schematic briefly describe the outdoor and indoor unit in a home terminal DBS TV receiving system. Why LNA subsystem is placed at the antenna end of the feeder cable. **07**
- (b) Define : (1) Apogee (2) Perigee (3) Line of apsides (4) Ascending node (5) Argument of perigee (6) Line of nodes (7) Inclination **07**
- Q.2** (a) What do you mean by Antenna Look Angles? A geostationary satellite is at 90° W. Calculate the azimuth angle for an earth station antenna at a latitude of 35° N and longitude 100° W **07**
- (b) Briefly discuss the phenomenon of eclipse due to earth as applied to a geostationary satellite and solar interference at earth station **07**
- OR**
- (b) Explain the functions of TT&C subsystems in detail. **07**
- Q.3** (a) Briefly describe the equipment section making up a transponder channel **07**
- (b) Define noise factor. The noise factor of an amplifier is 7:1. Calculate noise figure and equivalent noise temperature **07**
- OR**
- Q.3** (a) Explain what is meant by thermal control and why it is necessary in a Satellite. **07**
- (b) Calculate the overall noise temperature referred to the LNA input for LNA connected to a receiver which has a noise figure of 12 dB. The gain of the LNA is 40dB and its noise temperature is 120K **07**
- Q.4** (a) Explain Reference Burst and its need in TDMA system **07**
- (b) Explain: (1) attitude control. **07**
(2) Station keeping.
(3) Spinning satellite stabilization
- OR**
- Q.4** (a) Explain input and output back-off in power amplifier **07**
- (b) Explain what is meant by carrier-to-noise ratio? At the input to a receiver, the received carrier power is 40 pW and the system noise temperature is 450 K. Calculate the Carrier-to-noise density ratio in dBHz. Given the bandwidth of 36 MHz, calculate C/N ratio in dB. **07**
- Q.5** (a) Explain in detail the operation of the Spade system of demand assignment. What is the function of the common signaling channel? **07**
- (b) Describe and compare MATV and CATV systems **07**
- OR**
- Q.5** (a) Describe on-board signal processing for FDMA/TDM operation **07**
- (b) Explain briefly: (1) Pre assigned FDMA (2) Demand assigned FDMA **07**
