Seat No: _____ Enrollment No: _____

PARUL UNIVERSITY

FACULTY OF ENGINEERING & TECHNOLOGY

M.Tech. Winter 2017 - 18 Examination

Semester: 1 **Date: 02/01/2018**
Subject Code: 03204132 **Time: 2:00pm to 4:30pm**
Subject Name: Digital Satellite Communication **Total Marks: 60**

Instructions:
1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

Q.1 A) Explain basic Satellite communication system block diagram. **(05)**
B) Explain Spinning satellite stabilization. **(05)**
C) Explain different Satellite services. **(05)**

Q.2 **Answer the following questions. (Attempt any three)** **(15)**
A) Describe the following terms of Earth orbiting satellites. (1) Ascending node (2) line of apsides (3) Inclination (4) Apogee (5) Retrograde orbit.
B) Draw the block diagram of TT&C and explain its blocks.
C) Derive the overall noise temperature for Cascaded two port system.
D) Explain the block diagram of Global Positioning Satellite system.

Q.3 A) How does a 3 axis stabilized satellite operate? Explain how attitude control is done. **(07)**
B) Explain TDMA system in detail. **(08)**

OR

B) In a link-budget calculation at 12 GHz, the free-space loss is 206 dB, the antenna pointing loss is 1 dB, and the atmospheric absorption is 2 dB. The receiver [G/T] is 19.5 dB/K, and receiver feeder losses are 1 dB. The EIRP is 48 dBW. Calculate the carrier-to-noise spectral density ratio. **(08)**

Q.4 A) Calculate the radius of a circular orbit for which the period is 1 day. **(07)**

OR

A)Consider a 60-channel Frequency Division Multiplex system with a maximum baseband frequency of Fm=252Khz and specified top channel signal to noise ration S/N=52 dB. Assume that FDM multichannel RMS frequency deviation of lfr = 546Khz.Than Find FDM-FM-FDMA Carrier to noise ratio in decibels. **(07)**

B) An earth station is located at latitude 35˚N and 65˚E. Calculate the look angle for a satellite at 19˚E. **(08)**