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GUJARAT TECHNOLOGICAL UNIVERSITY PDDC - SEMESTER-VII • EXAMINATION - SUMMER • 2015

Subject Code: X71104 Date: 14/05/2015 **Subject Name: Satellite Communication** Time: 02:30 pm - 05:00 pm **Total Marks: 70 Instructions:** 1. Attempt all questions. Make suitable assumptions wherever necessary. Figures to the right indicate full marks. (a) Define apogee, perigee, inclination and line of nodes. Draw a figure explaining **Q.1** 07 these terms. (b) A satellite is orbiting in the equatorial plane with a period from perigee to 07 perigee of 12 h. Given that the eccentricity is 0.002, calculate semi-major axis. Mention the conditions required for an orbit to be a geostationary orbit. 07 **Q.2** (a) Describe a method to find antenna look angles. **(b)** 07 OR An earth station is located at latitude 12 degrees South and longitude 52 degrees 07 West. Calculate the antenna look angles for a satellite at 70 degrees West. Explain attitude control of satellite. 07 Q.3(a) Draw to scale the uplink and downlink channeling schemes for a 500 MHz 07 bandwidth C-band satellite accommodating full complement of 36 MHz bandwidth transponders with 4 MHz guard bands. In a satellite link, the propagation loss is 200 dB. Margins and other losses **Q.3** 07 account for another 3 dB. The receiver [G/T] is 11 dB and the [EIRP] is 45 dBW. Calculate the received [C/N] for a system bandwidth of 36 MHz. An attenuator has an attenuation of 6 dB. Calculate its noise figure and 07 equivalent noise temperature. **Q.4** (a) Explain pre assigned FDMA. 07 Explain reference burst, preamble and postamble in a TDMA system. 07 **(b) Q.4** (a) Compare uplink power requirements for FDMA and TDMA. 07 What is on board signal processing for FDMA/TDM operation? **(b)** 07 **Q.5** Explain in detail the operation of spade system of demand assignment. 07 (a) Explain in detail the operation of preassigned SCPC network. **(b) 07** Q.5 How frequencies and polarization are planned for DBS? 07 (a) Write a brief note on bit rates for digital television. 07
