Seat No.: _____   Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY
BE- SEMESTER–VII (NEW) EXAMINATION – WINTER 2020

Subject Code:2173207   **Date:21/01/2021**
Subject Name:Satellite Communication & Networking
Time:10:30 AM TO 12:30 PM   **Total Marks: 56**

Instructions:
1. **Attempt any FOUR questions out of EIGHT questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

			MARKS
Q.1	(a)	What are the advantages of Satellite Communication?	03
	(b)	Explain the Keplerian element set.	04
	(c)	Explain asynchronous transfer mode in detail.	07
Q.2	(a)	A geostationary Satellite is located at 90° W. Calculate azimuth angle for An earth station antenna is located at latitude 35°N and longitude 100°W.	03
	(b)	Draw and explain the block diagram of satellite communication in detail.	04
	(c)	Write a short note on the solar eclipse of satellite and sun transit outage.	07
Q.3	(a)	Explain atmospheric losses in detail.	03
	(b)	A satellite in an elliptical orbit around the earth has an apogee of 39,152 km and a perigee of 500 km. What is the orbital period of the satellite? Average earth radius is 6,378.137 km.	04
	(c)	Explain the block diagram of Satellite Transponder. Also explain the frequency reuse technique for Transponder.	07
Q.4	(a)	Describe the following terms of Earth orbiting satellites (1) Ascending node (2) line of apsides (3)Retrograde orbit	03
	(b)	Write a Short note on Atmospheric Drag.	04
	(c)	What is the purpose of Telemetry, Tracking, Command in satellite communication? Explain in detail.	07
Q.5	(a)	Differentiate XPD and Polarization Isolation.	03
	(b)	What is Free space loss? The range between a ground station and a satellite is 42,000 km. Calculate the free-space loss at a frequency of 6 GHz.	04
	(c)	Write a short note on TCP Link.	07
Q.6	(a)	Write differences between: Attitude control and orbital control	03
	(b)	Write a note on Rain depolarization.	04
	(c)	Write short notes on Demand Access Multiple Access system.	07
Q.7	(a)	Write a short note on Master Antenna TV Systems.	03
	(b)	What is meant by rain attenuation? Derive an equation for the same.	04
	(c)	Explain how to compute uplink and downlink C/N ratio for a typical satellite link.	07

Q.8 **(a)** A earth station have equivalent noise temperature of 200° K, noise bandwidth of 18 MHz, antenna gain of 50dB and carrier frequency of 12 GHz Determine, Gain to Equivalent Noise temperature ratio, Noise density, and Total Noise Power. **03**

(b) Write a short on various losses in uplink transmission. **04**

(c) What are the differences between multiplexing and multiple access techniques? Explain briefly Code division multiple access. **07**

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