QP Code: RA21BTECH807 | Reg. No | | | | | | | | | | | AR 21

Gandhi Institute of Engineering and Technology University, Odisha, Gunupur
(GIET University)

B. Tech (Eighth Semester - Regular) Examinations, April – 2025

21BECPE48011 – Satellite Communication

(ECE)

Time: 3 hrs | Maximum: 70 Marks

(The figures in the right hand margin indicate marks)

PART – A **(2 x 5 = 10 Marks)**

	Q.1. Answer ***ALL*** questions	CO #	Blooms Level
a.	Differentiate between Geostationary and Geosynchronous satellite.	CO1	K4
b.	Write the relation between noise figure and noise temperature.	CO3	K1
c.	What are the types of antenna used in satellite.	CO4	K2
d.	Write the different types of cloud attenuation related to satellite communication.	CO2	K2
e.	What is multiple access and write down the principle of operation of FDMA.	CO2	K1

PART – B **(15 x 4 = 60 Marks)**

	Answer ***all*** the questions	Marks	CO #	Blooms Level
2. a.	What are the Kepler's three laws of planetary motion? Explain in details.	8	CO1	K1
b.	Explain the attitude and orbit control system of a satellite.	7	CO2	K2
	(OR)			
c.	Enlist various types of launch vehicles. Why these launch vehicles are required for satellites?	8	CO1	K1
d.	Define look angle. Derive an expression for the Elevation angle for a Geostationary satellite.	7	CO1	K3
3.a.	What do you mean by G/T ratio in satellite communication system? Discuss its importance in an earth station.	8	CO3	K2
b.	Derive the expression of link equation using basic transmission theory.	7	CO2	K3
	(OR)			
c.	A GEO satellite carries a transponder with 20 W transmitter at 4 GHz. The transmitter is operated at an O/P power of 10 W and drives an antenna with a gain of 30 dB. An earth station is the centre of the coverage zone of the satellite, at range of 38500 km. Find (i) the flux density at the earth station, (ii) the power received by an antenna with a gain of 39 dB, (ii) the EIRP of the transponder.	8	CO2	K4
d.	What do you mean by transponder? Explain about the single bent pipe transponder with suitable diagram.	7	CO3	K1
4.a.	Write down the design procedure for a one-way satellite communication.	8	CO4	K3
b.	Explain Rain and ice effects on satellite link.	7	CO3	K2
	(OR)			
c.	Describe the complete uplink and downlink system design for C band satellite communication system.	8	CO4	K3
d.	Write short notes on Cassegrain Antenna and SPADE.	7	CO3	K1
5.a.	How can parabolic reflectors used in satellite communication to enhance the gain of antennas?	8	CO3	K3
b.	Explain the non-hydrometric effect on satellite in details.	7	CO4	K2
	(OR)			
c.	Explain about CDMA technique in details. How the PN code can be generated in CDMA?	8	CO1	K2
d.	What are the antennas used in satellite communication? Explain.	7	CO2	K1

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