QPC: RA20BTECH859 AY 20 Reg. No | | | | | | | | | | |

GIET UNIVERSITY, GUNUPUR – 765022

B. Tech (Eight Semester – Regular) Examinations, April– 2024

BPEEC8010 – Satellite Communication

(ECE)

Time: 3 hrs Maximum: 70 Marks

The figures in the right hand margin indicate marks.

PART – A: (Multiple Choice Questions) **(1 x 10 = 10 Marks)**

Q.1. Answer ***ALL*** questions		[CO#]	[PO#]
a.	Kepler's first law states?		
	(i) The path followed by a satellite around the primary will be an ellipse	(ii) The path followed by a satellite around the primary will be a circle	CO1	PO1
	(iii) The path followed by a satellite around the primary will be a sphere	(iv) None of the above		
b.	The carrier to noise ratio for a satellite depends upon			
	(i) Bandwidth	(ii) Free space path losses	CO4	PO1
	(iii) Effective Isotropic Radiated power	(iv) All of the above		
c.	For an elliptical orbit?			
	(i) e = 0	(ii) 0 < e < 1	CO2	PO2
	(iii) e = 1	(iv) None of the above		
d.	What are the types of antenna losses?			
	(i) sky noise	(ii) Antenna losses	CO3	PO1
	(iii) sky noise and Antenna losses	(iv) All of these		
e.	Space waves are:			
	(i) line-of-sight	(ii) reflected off the ionosphere	CO4	PO1
	(iii) same as sky waves	(iv) radio waves used for satellite communication		
f.	Geostationary satellites are located at a height of			
	(i) 3600 km from earth's surface	(ii) 360,000 km from earth's surface	CO1	PO2
	(iii) 36000 km from earth's surface	(iv) 3600,000 km from earth's surface		
g.	The multiple access technique suitable only for digital transmission is			
	(i) FDMA	(ii) TDMA	CO4	PO1
	(iii) Both (i)and (ii)	(iv) Packet Access		
h.	TDD technique in multiplexing stands for _____.			
	(i) Time division duplex	(ii) Time double division	CO3	PO1
	(iii) Time duplex division	(iv) Time division double		
i.	For global communication, the minimum number of satellites needed is			
	(i) 1	(ii) 7	CO2	PO1
	(iii) 2	(iv) 3		
j.	Satellite receives signal from			
	(i) Microwave repeater stations	(ii) Appropriate earth station	CO4	PO1
	(iii) TV relay station	(iv) All of the above		

PART – B: (Short Answer Questions) **(2 x 10 = 20 Marks)**

Q.2. Answer ***ALL*** questions		[CO#]	[PO#]
a.	What do you mean by satellite? Write four applications of satellite communication.	CO1	PO1
b.	Differentiate between Geostationary and Geosynchronous satellite.	CO1	PO1
c.	An amplifier has a quoted noise figure of 2.2 dB. what is its equivalent noise temperature?	CO1	PO2
d.	What is the significance of EIRP in satellite communication?	CO2	PO1
e.	Define energy dispersal.	CO3	PO2
f.	Write the different types of cloud attenuation related to satellite communication.	CO2	PO1
g.	How (G/T) ratio can be expressed in terms of (C/N) ratio?	CO4	PO3
h.	Write the necessity of look angle.	CO3	PO3
i.	Mention the use of LNA in satellite communication.	CO4	PO1
j.	Write the different types of cloud attenuation related to satellite communication.	CO4	PO2

PART – C: (Long Answer Questions) **(10 x 4 = 40 Marks)**

Answer ***ALL*** questions		Marks	[CO#]	[PO#]
3. a.	What do you mean by Orbit? Explain about the different orbits of satellite communication with suitable diagram.	5	CO1	PO1
b.	Define look angle. Derive an expression for the Azimuth angle for a Geostationary satellite.	5	CO3	PO3
	(OR)			
c.	What are the Kepler's three laws of planetary motion? Give the mathematical formulation of Kepler's third law of planetary motion. What do the terms perigee and apogee mean when used to describe the orbit of a satellite orbiting the earth?	5	CO1	PO2
d.	Explain the attitude and orbit control system of a satellite.	5	CO4	PO1
4. a.	Explain about the basic principle of DSSS system with suitable diagram.	5	CO3	PO1
b.	Explain the tropospheric scintillation and low angle fading.	5	CO4	PO1
	(OR)			
c.	Derive the expression of the power received by an earth station from a satellite transmitter.	5	CO2	PO2
d.	A satellite at a distance of 40,000 km from a point on the earth's surface radiates a power of 10 w from an antenna with a gain of 17 dB in the direction of the observer. Find the flux density at the receiving point and the power received by an antenna at this point with an effective area of 10 m2.	5	CO1	PO2
5. a.	Explain how satellite communication system implements TDMA?	5		
b.	Describe about the role of TTC&M in satellite communication.	5	CO2	P03
	(OR)			
c.	Describe the complete uplink and downlink system design for C band satellite communication system.	5	CO4	PO2
d.	Write short notes on Cassegrain Antenna and SPADE.	5	CO3	PO1
6. a.	Write down the design procedure for a one-way satellite communication link.	5	CO4	PO1
b.	Discuss the propagation effects that are not associated with the hydrometeors.	5	CO3	PO2
	(OR)			
c.	How can parabolic reflectors used in satellite communication to enhance the gain of antennas?	5	CO3	PO2
d.	Explain the non-hydrometric effect on satellite.	5	CO2	PO1

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