CBCS SCHEME

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BEC515D

Fifth Semester B.E./B.Tech. Degree Examination, Dec.2024/Jan.2025
Satellite and Optical Communication

Time: 3 hrs. Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.

		Module – 1	M	L	C
Q.1	a.	Explain the Keplar laus of planetary motion. Also derive the expression for orbital period.	10	L2	CO1
	b.	A satellite is orbiting earth in a uniform circular orbit at a height of 630 kM from the surface of earth. Assuming the radius of earth and its mass to be 6370 kM and 5.98×10^{24} kg respectively. Determine the velocity of the satellite. (Take gravitational const $G = 6.67 \times 10^{-11}$ Nm^2/kg^2).	10	L3	CO1
		OR			
Q.2	a.	The apogee and perigee distance of satellite arbiting in an elliptical orbit are respectively, 45000 km and 7000 km. Determine the followings: i) Semi-major axis of the elliptical orbit. ii) Orbit eccentiricity iii) Distance between the center of earth and the center of elliptical orbit.	10	L3	CO1
	b.	Explain briefly any six orbital parameters required to determine a satellite orbit.	10	L2	CO1
		Module – 2			
Q.3	a.	Explain the satellite subsystems.	10	L2	CO2
	b.	Explain the solar energy driven power supply system of a satellite.	10	L2	CO2
		OR			
Q.4	a.	Describe the telemetry, telecommand and tracking control monitoring system of a communication satellite.	10	L2	CO2
	b.	Explain with block schematic arrangement of a generalized earth's station.	10	L2	CO2
		Module – 3			
Q.5	a.	What is transponder? Explain the various types of transponders.	10	L2	CO3
	b.	List the advantages and disadvantages of satellites with respect to terrestrial networks.	10	L1	CO3
		OR			
Q.6	a.	Explain with a neat diagram satellite point-to-point telephonic network.	10	L2	CO3
	b.	Explain with a neat diagram satellite – cable TV.	10	L2	CO3

		Module – 4			
Q.7	**a.**	Explain the mode theory as applied to circular wavelength (wave guides) in optical fibers.	**10**	**L2**	**CO4**
	b.	Describe the operational difference between single-mode and multimode fibers in terms of bandwidth and attenuation.	**10**	**L2**	**CO4**
		OR			
Q.8	**a.**	What is modal delay and how does it contribute to modal dispersion in multimode fibers?	**10**	**L2**	**CO4**
	b.	Define material dispersion and explain how it arises in optical fibers.	**10**	**L2**	**CO4**
		Module – 5			
Q.9	**a.**	Explain the principle operation of LED's.	**10**	**L2**	**CO5**
	b.	Discuss the characteristics of the optical detectors.	**10**	**L2**	**CO5**
		OR			
Q.10	**a.**	Explain the principle operation of WDM standards.	**12**	**L2**	**CO5**
	b.	Explain the isolators and circulators.	**8**	**L2**	**CO5**

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