



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 Kepler laws 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 $G = 6.67 \times 10^{-11} \text{ Nm}^2/\text{kg}^2$).	10	L3	CO1
OR					
Q.2	a.	The apogee and perigee distance of satellite orbiting in an elliptical orbit are respectively, 45000 km and 7000 km. Determine the followings: i) Semi-major axis of the elliptical orbit. ii) Orbit eccentricity 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

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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
