Register No : _____

THE KAVERY ENGINEERING COLLEGE

(An Autonomous Institution)

B.E/B.TECH DEGREE END SEMESTER THEORY EXAMINATIONS, NOV /DEC 2024

First Semester

UPHT24103/PH3151 – Engineering Physics

(Common to all Branches)

Regulations – 2021 & 2024

Duration : 3 Hrs *Maximum : 100 Marks*

*PART – A (ANSWER ALL QUESTIONS) (Marks 10*2=20)*

Q.No	*Questions*	*BLT*	*CO*	*Marks*
1.	State parallel axis theorem.	RE	1	2
2.	What is a torsional pendulum?	RE	1	2
3.	Identify any four properties of electromagnetic waves.	AP	2	2
4.	Define the term radiation pressure.	RE	2	2
5.	Distinguish between progressive waves and stationary waves.	AN	3	2
6.	Calculate the wavelength of light emission from GaAs whose band gap is 3 eV.	AP	3	2
7.	List any four properties of matter waves.	RE	4	2
8.	Define Compton effect.	RE	4	2
9.	State the principle of resonant diode.	RE	5	2
10.	What is quantum harmonic oscillator?	RE	5	2

*PART – B (ANSWER ALL QUESTIONS) (Marks 5*16 = 80)*

Q.No		*Questions*	*BLT*	*CO*	*Marks*
11.	a	Derive the relation between rotational kinetic energy and moment of inertia and write a short note on moment of inertia of a diatomic molecule.	AP	1	16
		Or			
	b	Describe the principle, construction and working of gyroscope and mention its application in various fields.	AP	1	16
12.	a	Show how the wave equation for plane electromagnetic waves in a vacuum can be derived from Maxwell's equations.	UN	2	16
		Or			
	b	Discuss in detail the reflection and transmission of electromagnetic equation from a non- conducting medium.	UN	2	16
13.	a	Describe how interference fringes are formed in an air-wedge-shaped film. Explain how this method is used to calculate the thickness of a wire.	UN	3	16
		Or			

	b	Explain the vibrational modes of the CO_2 molecule and describe the design and operation of a CO_2 laser with supporting diagrams.	UN	3	16
14.	a	Derive Schrodinger time independent and dependent wave equations.	AN	4	16
		Or			
	b	Derive an expression for the energy levels of a particle confined in a one-dimensional potential box of width “a”.	AN	4	16
15.	a	Explain the concepts of barrier penetration and quantum tunneling in detail with necessary diagram.	UN	5	16
		Or			
	b	Write a brief note on Bloch’s theorem for particles in a periodic potential and the Kronig-Penney Model.	UN	5	16