

THE KAVERY ENGINEERING COLLEGE*(An Autonomous Institution)***B.E/B.TECH DEGREE END SEMESTER THEORY EXAMINATIONS, APRIL-MAY 2025*****First Semester******Agricultural Engineering*****PH3151/UPHT24103-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.	L 2	1	2
2.	A small object of mass 20 Kg rotating in circle of diameter 0.20 m at the rate of 2000 rev min. Find the rotational kinetic energy of the object.	L 3	1	2
3.	List the properties of Electromagnetic Waves.	L 1	2	2
4.	Define radiation pressure.	L 1	2	2
5.	Distinguish between progressive waves and stationary waves.	L 2	3	2
6.	Mention the applications of laser in industry.	L 1	3	2
7.	Write an expression for the wavelength of matter waves.	L 1	4	2
8.	State correspondence principle.	L 2	4	2
9.	Define resonant diode.	L 1	5	2
10.	State Bloch theorem.	L 2	5	2

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

Q.No	Questions	BLT	CO	Marks
11.	a Define moment of inertia. Show that the moment of inertia with respect to its own axis of a solid disc and solid cylinder are equal.	L 2	1	16
	Or			
	b Explain the principle of Torsion Pendulum and derive the equation for rigidity modulus of the material of a thin wire using torsion pendulum.	L 2	1	16
12.	a Derive the Maxwell's equations in differential form.	L 3	2	16
	Or			
	b Derive the expression for reflection and transmission coefficients of electromagnetic waves normal incident on the interface of non-conductor medium and free space.	L 3	2	16

13.	a	What is meant by a plane progressive wave? Derive its wave equation.	L 2	3	16
		Or			
	b i	Distinguish between spontaneous emission and stimulated emission of radiation.	L 2	3	4
	i	Derive the relation between Einstein's coefficients of spontaneous and stimulated emissions.	L 2	3	12
14.	a	Derive the expression for Compton shift of a scattered photon.	L 3	4	16
		Or			
	b	Derive Schrödinger's time independent and dependent wave equations.	L 3	4	16
15.	a	Describe the principle, construction and working of scanning tunneling microscope. Also mention its merits and demerits.	L 2	5	16
		Or			
	b	Explain the origin of band gap when the electron is moving in a periodic potential. Also explain kronig penney model.	L 2	5	16