Q. Code: 386605

Reg. No. | | | | | | | | | | | | | |

B.E. / B.TECH. DEGREE EXAMINATIONS, MAY 2023

First Semester

PH22152 – Engineering Physics

(Common to AE, CE, ME, MN & MR)

(Regulation 2022)

TIME: 3 HOURS **MAX. MARKS: 100**

COURSE OUTCOMES	STATEMENT	RBT LEVEL
CO 1	Formulate general mechanics parameters and Gain knowledge in Mechanics	**4**
CO 2	Evaluate the concepts of properties of matter and thermal physics	**3**
CO 3	Learn to solve the issues related to defects in the buildings due to acoustic design and the significance of ultrasonic waves	**3**
CO 4	Describe the basic laser physics and develop an understanding about photonics and Fiber Optic communication system	**3**
CO 5	Classify and demonstrate the fundamentals of crystals and their defects.	**3**

PART- A (20 x 2 = 40 Marks)

(Answer all Questions)

		CO	RBT LEVEL
1.	Define Radius of Gyration. Give its unit.	**1**	**2**
2.	Obtain the relation between kinetic energy of the rotating body and moment of inertia.	**1**	**3**
3.	State theorem of Perpendicular Axis.	**1**	**2**
4.	A solid disc has a mass of 5kg and radius 1m. Find its moment of Inertia	**1**	**3**
5.	How does mass density of the fluid vary with pressure and temperature?	**2**	**3**
6.	Describe three states of equilibrium based on center of Gravity and center of Buoyancy.	**2**	**2**
7.	Sketch measurement of Gauge and Absolute Pressure at Points A and B.	**2**	**3**
8.	Define Relative density of a fluid.	**2**	**2**
9.	What are the characteristics of Musical sound?	**3**	**2**
10.	State Weber-Fechner law.	**3**	**2**
11.	Calculate the frequency of 40mm length of pure iron rod. Given the density of pure iron is $7.25 \times 10^3 Kg/m^3$ and its Young's Modulus is 115GPa.	**3**	**3**
12.	What is SONAR?	**3**	**2**
13.	Give the conditions for Laser action.	**4**	**2**
14.	Give the Principle of Magnetostriction Oscillator.	**4**	**3**
15.	Calculate Numerical Aperture and Acceptance angle of an optical fibre having core and cladding refractive index 1.5 and 1.45 respectively.	**4**	**3**
16.	What is Attenuation loss in Optical fibre?	**4**	**2**
17.	Determine atomic radius of iron crystal of edge length 0.38 nm.	**5**	**3**
18.	Define Unit Cell.	**5**	**2**
19.	Draw following planes by determining its intercept (110), (111)	**5**	**3**
20.	What is Crystal Defect?	**5**	**2**

PART- B (5 x 10 = 50 Marks)

			Marks	CO	RBT LEVEL
21. (a)	**(i)**	Obtain an expression for moment of inertia of a Hollow sphere in which mass is concentrated over the surface of the sphere.	**(5)**	**1**	**4**
	(ii)	Obtain an expression for moment of inertia of a Hollow cylinder and hence deduce the moment of inertia if inner radius is zero and outer radius 'R'.	**(5)**	**1**	**4**
		(OR)			
(b)		With an experiment, Deduce the expression for moment of inertia of the disc and rigidity modulus of the wire of length 'l' by producing Torsional oscillations.	**(10)**	**1**	**4**
22. (a)		Explain various properties of fluids with units and how it varies with temperature and pressure	**(10)**	**2**	**3**
		(OR)			
(b)		Derive an expression for heat conduction through a compound media with same dimensions connected in series and Parallel.	**(10)**	**2**	**3**
23. (a)		Describe the factors affecting good acoustics of a building and how it can be minimized.	**(10)**	**3**	**2**
		(OR)			
(b)		With a neat diagram, describe the production of ultrasonic waves by Magnetostriction method and discuss its merits and demerits.	**(10)**	**3**	**2**
24. (a)		Discuss various types of Optical fibers based on materials, modes of propagation and refractive index profile.	**(10)**	**4**	**3**
		(OR)			
(b)		Applying the Principle of Doped Insulator Laser, Explain the construction and working of Nd-YAG laser with a neat diagram.	**(10)**	**4**	**3**
25. (a)		What are Miller Indices? Deduce an expression relating interplanar distance, lattice constant and miller indices.	**(10)**	**5**	**3**
		(OR)			
(b)		Show that FCC crystals are closely packed than BCC Crystals.	**(10)**	**5**	**3**

PART- C (1 x 10 = 10 Marks)

(Q.No.26 is compulsory)

		Marks	CO	RBT LEVEL
26.	With a neat diagram describe a method to determine Coefficient of Thermal conductivity of a bad conductor.	**(10)**	**2**	**3**