LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

U.G. DEGREE EXAMINATION – **ALLIED**

THIRD SEMESTER – **APRIL 2023**

16/17/18UPH3AL01 – PHYSICS FOR CHEMISTRY - I

Date: 10-05-2023   Dept. No.   Max. : 100 Marks
Time: 01:00 PM - 04:00 PM

	PART – A (10 x 2 = 20 Marks)
Q. No.	**Answer ALL questions**
1	Draw the velocity versus time graph of a uniformly accelerated body.
2	State the law of conservation of momentum.
3	Distinguish between elastic and plastic materials.
4	Give the unit and dimension of viscosity.
5	State Boyle's law.
6	Write ideal gas equation and explain its significance.
7	What is unit cell of crystal lattice?
8	Define Miller indices.
9	What are inertial and non-inertial frames of reference?
10	State the postulates of special theory of relativity.

	PART – B (4 x 7.5 = 30 Marks)
	Answer any FOUR questions
11	Determine the time period of oscillation of a liquid in an U-tube.
12	Find the time period of oscillations of two springs connected in (a) series (b) parallel.
13	a) Define surface tension and give its dimensional formula. (2.5) b) Explain the molecular theory of surface tension. (5)
14	State and derive Bragg's law of X-ray diffraction.
15	a) Define relativistic length contraction. (2) b) Derive Einstein's mass energy equation. (5.5)
16	Derive the expression to determine the excess pressure in a liquid drop.

	PART – C (4 x 12.5 = 50 Marks)
	Answer any FOUR questions
17	a) Define Poisson's ratio. (2.5) b) Derive the relation connecting the three moduli of elasticity. (10)
18	Derive an expression for the maximum height, time of flight and horizontal range of a body projected at an angle with the horizontal.
19	a) What is an adiabatic process? Derive an equation for an adiabatic process. (9) b) The volume of certain mass of gas at a pressure of 5×10^4 Pa is doubled adiabatically. Calculate the final pressure of the gas. ($\gamma =1.4$) (3.5)
20	Explain the rotating crystal method to determine the inter planar spacing of a crystal.
21	Derive Lorentz transformation equations.
22	Derive Poiseuille's formula for the rate of flow of liquid through a capillary tube.

$$\$\$\$\$\$\$\$$