LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – **CHEMISTRY**

THIRD SEMESTER – **APRIL 2022**

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

Date: 21-06-2022   Dept. No.   Max. : 100 Marks
Time: 09:00 AM - 12:00 NOON

PART – A

Q. No	Answer ALL Questions	(10 x 2 = 20 Marks)

1   Draw velocity versus time graph.
2   State law of conservation of momentum.
3   What is Poisson's ratio?
4   Give the unit and dimension of viscosity.
5   State the first law of thermodynamics.
6   Write the unit of pressure and work done.
7   What is unit cell?
8   State the Bragg's law.
9   Distinguish between inertial and non-inertial frame of reference.
10   Write down the Galilean transformations equations.

PART – B

Answer any FOUR Questions	(4 x 7.5 = 30 Marks)

11   Determine the time period of oscillation of a liquid in a U-tube.
12   Derive an expression to calculate the excess pressure inside a liquid drop.
13   (i) Derive perfect gas equation.   **(4)**
     (i) Differentiate saturated and unsaturated vapours.   **(3.5)**
14   Give a short note on classification of various crystal systems.
15   Derive Einstein's mass-energy equation.
16   Derive the expression for energy stored in a wire.

PART – C

Answer any FOUR Questions	(4 x 12.5 = 50 Marks)

17   Derive the expression for time period of oscillations in simple pendulum.
18   (i) Derive Poiseuille's formula for the rate of flow of liquid through a capillary tube.
      (ii) Water flows through a horizontal tube of length 0.2 m and internal radius 8.1 x 10^{-4} m under a constant head of the liquid 0.2 m high. In 12 minutes 8.64 x 10^{-4} m^3 of liquid flows out from the tube. Calculate the coefficient of viscosity of water. Given, the density of water is 1000 kg/m^3 and g is 9.81 m/s^2.

19   Describe Michelson-Morley experiment and discuss its negative results.
20   Establish the relation between the three moduli of elasticity.
21   Describe Michelson-Morley experiment and discuss its negative results.
22   (i) State Avogadro's Hypothesis and hence derive the general gas equation.
     (ii) One litre of an ideal gas at a pressure of 6 atm undergoes an adiabatic expansion until its pressure drops to one atmosphere and volume increases to 2 litre. Find the work done during the process. [$\gamma=1.4$].

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