LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

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

THIRDSEMESTER – APRIL 2018

16UPH3AL01- PHYSICS FOR CHEMISTRY - I

Date: 03-05-2018 Dept. No. Max. : 100 Marks
Time: 01:00-04:00

PART-A

Answer ALL the questions **(10x2=20)**

1. Define relative velocity.
2. State the law of conservation of momentum.
3. Give the unit and dimension of surface tension.
4. State Hooke's law.
5. Write the ideal gas equation.
6. State Avogadro's hypothesis.
7. What is a unit cell?
8. Define basis.
9. What is an inertial frame of reference?
10. A particle of rest mass m_0 moves with a speed $\frac{c}{\sqrt{2}}$. Calculate its relativistic mass.

PART-B

Answer any FOUR questions **(4x7.5=30)**

11. Determine the range of a particle in projectile motion and hence determine the condition for maximum range.
12. Derive an expression to calculate the excess pressure inside a liquid drop.
13. With a neat diagram, explain the demonstration of Dalton's law of partial pressure.
14. Give a short note on classification of various crystal systems.
15. Derive Einstein's mass energy equation.
16. Explain torsional oscillation method to determine the rigidity modulus of a material.

PART C

Answer any FOUR questions **(4x12.5=50)**

17. Derive the time period of oscillation of a simple pendulum executing simple harmonic motion and verify the same by energy method.
18. Establish the relation between the three moduli of elasticity.
19. a) State and explain the laws of thermodynamics **(7)**

    b) Write an expression to find the work done by a gas during expansion. Calculate the external work done by a gas of volume $0.02m^3$ at a pressure $2x10^5$ Pa and temperature of 27 ^oC. Given increase in the volume is $0.03m^3$. **(5.5)**

20. a) State Bragg's law. **(2.5)**

    b) Explain the powder method to determine the interplanar spacing of a crystal. **(10)**
21. Describe Michelson-Morley experiment and discuss its negative results.
22. a) Define viscosity and write its unit and dimension **(4)**

    b) Derive Poiseuille's formula for the rate of flow of liquid through a capillary tube. **(8)**

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