



LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – CHEMISTRY

SECOND SEMESTER – APRIL 2017

PH 2105/ PH 2103 - PHYSICS FOR CHEMISTRY - I

Date: 25-04-2017
01:00-04:00

Dept. No.

Max. : 100 Marks

PART A

Answer ALL the questions:

(10 × 2 = 20)

1. What is angular velocity?
2. Define the term constraints.
3. State Kepler's laws of planetary motion.
4. Given that acceleration due to gravity is 9.8 m/s^2 and radius of the earth is 6400 km, estimate the value of escape velocity.
5. Define surface tension and write its unit.
6. State Hooke's law.
7. What is double refraction?
8. Differentiate between Fresnel and Fraunhofer diffraction.
9. State Bragg's law.
10. What are Miller indices?

PART B

Answer any FOUR questions:

(4 × 7.5 = 30)

11. What is a projectile? Derive expressions for range, time of flight and maximum height reached.
12. What is parking orbit? Calculate the radius of parking orbit of earth.
13. Derive Poiseuille's formula for the rate of flow of liquid through a capillary tube.
14. How would you produce and detect circularly polarized light?
15. Define surface energy. Derive the expression for excess pressure inside a liquid drop.
16. With suitable diagrams explain in detail the seven classes of crystal.

PART C

Answer any FOUR questions:

(4 × 12.5 = 50)

17. Set up the Lagrangian equation and solve the Lagrange's equation of motion for Atwood's machine and simple pendulum.
18. Describe an accurate method of determining the value of the gravitational constant G.

19. (a) Obtain the relation between the three moduli of elasticity.
(b) Calculate the work done in stretching a uniform metal wire of area of cross - section 10^{-6} m^2 and length 1.5 m through $4 \times 10^{-3} \text{ m}$. (Take Young's modulus, $q = 2 \times 10^{11} \text{ N/m}^2$)
20. Give the theory of a diffraction grating. Describe in detail how a transmission grating can be used for measuring the wavelength of light.
21. Explain the powder diffraction experimental method of analyzing structure of polycrystalline materials.
22. Explain the body centered cubic and face centered cubic crystal structures.

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