

LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034



B.Sc. DEGREE EXAMINATION – CHEMISTRY

SECOND SEMESTER – APRIL 2013

PH 2105/2103 - PHYSICS FOR CHEMISTRY - I

Date : 06/05/2013

Dept. No.

Max. : 100 Marks

Time : 9:00 - 12:00

Part – A

Answer ALL Questions.

(10x2=20)

1. Define velocity.
2. What are generalized coordinates?
3. State Kepler's law of planetary motion.
4. State the postulates of general theory of relativity.
5. Define Poisson's ratio.
6. Calculate the elastic energy stored up in a wire originally 5m long and 10^{-3} m in diameter which has been stretched by 3×10^{-4} m due to a load of 10 kg.
7. What is double refraction?
8. Distinguish between Fresnel and Fraunhofer diffraction.
9. State Bragg's law.
10. Define unit cell.

Part – B

Answer any FOUR Questions.

(4x7.5=30)

11. Derive an expression for the maximum height, time of flight and horizontal range of a body projected at an angle with the horizontal.
12. (a) Write short note on parking orbits (3)
(b) Describe an experiment to find gravitational constant. (4.5)
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. Explain rotating crystal method in X-ray diffraction studies.

Part – C

Answer any FOUR Questions.

(4x12.5=50)

16. Set up the Lagrangian equation and solve the Lagrange's equation of motion for Atwood's machine and simple pendulum.
17. (a) Define escape velocity. Derive an expression for the escape velocity of a body from any planet and find the escape velocity of a body from the surface of the earth. (Radius of earth= 6.38×10^6 m.) (9.5)
(b) Write short note on gravitational red shift. (3)
18. Explain in detail the Quincke's method for determining the surface tension and the angle of contact of mercury.

19. Give the theory of a diffraction grating. Describe in detail how you would use a transmission grating for measuring the wavelength of light.
20. (a) Name the seven crystal systems and write the relation between their lattice parameters.
(7.5)
- (b) What are Miller's indices? Write the procedure for finding Miller indices of a given plane.
(5)