LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

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

THIRD SEMESTER – NOVEMBER 2016

PH 3102 - PHYSICS FOR CHEMISTRY

Date: 14-11-2016 Dept. No. Max. : 100 Marks
Time: 09:00-12:00

Part A

Answer **all** the questions. **(5 × 2 = 10 marks)**

1. What are free oscillations? Give an example.
2. A particle moves with a constant velocity parallel to the important axis. What is angular momentum of it with respect to origin?
3. Mention two uses of polar satellite.
4. What is parking orbit?
5. State Hooke's law.
6. Define Poisson ratio. What is the maximum possible value it can have?
7. State Heisenberg's uncertainty principle.
8. Enumerate the inadequacies of classical mechanics.
9. Write time-independent Schrodinger wave equation.
10. What are beats?

Part B

Answer any **four** questions. **(2 × 7.5 = 15 marks)**

11. Derive the expression of frequency for horizontal oscillation of a spring mass system.
12. State and explain Kepler's laws of planetary motion.
13. Obtain the Poiseuille's formula for rate of flow of liquid through a capillary tube.
14. Set up Schrodinger wave equation for a particle confined to an Infinite Square well potential and solve it to get normalized eigen values and normalized eigen function.
15. A) State the laws of transverse vibration of a stretched string.
    B) Two strings each of length 60 cm are stretched, one by a force of 4Kg wt. and other by a force of 9 Kg wt. What is the interval between the two nodes that are produced? **(5.5+2)**

Part C

Answer any **Four** questions. **(2 × 12.5 = 25 marks)**

16. A) Derive the expression for time period of oscillation of the simple pendulum.
    B) Show that total energy of a particle executing simple harmonic motion is $\frac{1}{2}(m\omega^2 a^2)$ **(6.5+6)**
17. With a neat diagram discuss Cavendish experimental method of determining the value of Gravitational constant (G).
18. Derive the relation between three moduli of elasticity q, n & k.
19. With a neat diagram, explain how Davisson and Germer experiment served as experimental confirmation of De-broglie hypothesis.
20. Show that the fundamental frequency of vibration of a stretched string is n = $\frac{1}{2l}\frac{\sqrt{T}}{m}$

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