



LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – PHYSICS

SECOND SEMESTER – NOVEMBER 2013

PH 2503/PH 2501/PH 2500 – MECHANICS

Date : 06/11/2013

Dept. No.

Max. : 100 Marks

Time : 1:00 - 4:00

PART – A

Answer ALL Questions:

(10 x 2 = 20)

1. What is angular momentum?
2. Define Centre of Mass.
3. Define Centre of Gravity of a body.
4. What is a streamline flow?
5. State and explain Bernoulli's theorem.
6. Define rate of effusion
7. Give any two illustrations for constraints of equation.
8. Define Virtual work.
9. State Kepler's law of planetary motion.
10. Briefly explain velocity of escape.

PART – B

Answer any FOUR Questions:

(4 x 7.5 = 30)

11. Find the time period of oscillations of a bifilar pendulum suspended by parallel threads.
12. Show that the centre of gravity lies at one third of the altitude of a solid tetrahedron from its vertex.
13. Explain Fick's law of diffusion (2.5). Give the relation between time of diffusion and length of column(5).
14. Derive an expression for centripetal accelerations of a bead sliding on an uniformly rotating wire.
15. Deduce the Newton's law of gravitation from Kepler's laws.

PART – C

Answer any FOUR Questions:

(4 x 12.5 = 50)

16. Explain with graph, how radius of gyration k , can be calculated using a simple compound pendulum.
17. Define Centre of Pressure (2.5). Find the centre of pressure of triangular lamina immersed in a liquid with its vertex on the surface and base horizontal not subjected to any external pressure (10).
18. Explain in detail (i) Torricelli's Theorem. (6.5)
(ii) Venturimeter. (6)
19. Derive Lagrange's equation of motion from D'Alembert's Principle.
20. Describe Boy's method for determining the universal gravitational constant.

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