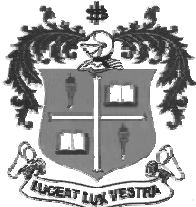# LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – **MATHEMATICS**

THIRD SEMESTER – **NOVEMBER 2013**

PH 3104/3100 - PHYSICS FOR MATHEMATICS - I

Date : 16/11/2013
Time : 9:00 - 12:00

Dept. No.

Max. : 100 Marks

PART A

Answer **ALL** questions: 10 x 2 = 20

1. Distinguish between distance and displacement.

2. What are generalized coordinates?

3. State Newton's law of gravitation.

4. Define escape velocity.

5. State Hooke's law of elasticity.

6. Define surface tension of a liquid.

7. Draw the circuit diagram of Inverting Operational amplifier.

8. Write a note about electronic counters.

9. State the postulates of special theory of relativity.

10. Define Inertial and Non Inertial Frames of reference.

PART B

Answer any **FOUR** questions: 4 x 7.5 = 30

11. Explain distance time graph and velocity time graph for a moving object.

12. a) State all the three Kepler's laws of planetary motion. (6)

    b)Define parking orbit of a satellite.(1.5)

13. Derive an expression for the energy stored in a stretched wire.

14. Explain Op-amp as i) summing amplifier and ii) difference amplifier.

15. Derive Einstein's mass energy relation.

PART C

Answer any **FOUR** questions: 4 x 12.5 = 50

16. Derive Lagrange's equation of motion from D'alembert's principle.

17. Explain Boy's experiment to determine Universal gravitational constant G with a neat diagram.

18. With a neat sketch explain the Quinke's method to determine the surface tension of mercury.

19. Explain the working of i)Half adder and ii)Full adder with diagram and truth table.(4.5+4+4)

20. Describe Michelson-Morley experiment to disprove the theory of ether hypothesis and discuss the results obtained.

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