LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

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

FIRST SEMESTER – **NOVEMBER 2019**

UPH 1301 – PHYSICS FOR MATHEMATICS

Date: 05-11-2019   Dept. No.   Max. : 100 Marks
Time: 09:00-12:00

PART – A

Answer **ALL** questions: **(10x2=20)**

1. Draw the velocity time graph for a particle moving with constant velocity.

2. Define simple harmonic motion.

3. What is meant by Gravitational field strength?

4. State the Kepler's laws.

5. Write the unit and dimensional formula of the Young`s modulus.

6. Define coefficient of viscosity.

7. What are intrinsic and extrinsic semiconductors? Give examples.

8. Using diodes draw the circuit diagram of AND gate and write its truth table.

9. Define Inertial and Non Inertial Frames of reference.

10. A rod of 1 m length is moving along its length with a velocity 0.8c. Calculate its length as it appears to an observer on earth.

PART – B

Answer any **FOUR** questions: **(4x7.5=30)**

11. Determine the time period of oscillation of a liquid in a U-tube.

12. Explain escape velocity. Show that the escape velocity from the surface of the earth is 11 km/s.

13. Derive Poiseuille's formula for the rate of flow of liquid through a capillary tube.

14. Derive Lorentz transformation equations.

15. Establish that NAND and NOR are Universal gates.

16. (a) Define velocity and acceleration and give their unit.   **(3 marks)**

    (b) Sketch the distance-time graph and velocity – time graph of uniformly accelerated motion.

                                                                             (4.5 marks)

PART – C

Answer any **FOUR** questions: **(4x12.5=50)**

17. Explain the vertical oscillations of a spring when they are connected in parallel and series.

18. Describe the Boy's method of determining gravitational constant G with appropriate diagram.

19. Derive the expression for the excess pressure in a liquid drop.

20. With neat sketch explain the I-V Characteristics of Zener diode.

21. Describe Michelson-Morley experiment to disprove the theory of ether hypothesis and discuss the

    results obtained there on.

22. (a) What is a projectile?   **(2 marks)**

    (b) Derive an expression for the time of flight, range and maximum height for an object at an angular

       projection   **(10.5 marks)**

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