LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION –MATHEMATICS

THIRD SEMESTER – APRIL 2019

PH 3104 / PH 3100 – PHYSICS FOR MATHEMATICS - I

Date: 13-04-2019   Dept. No.   Max. : 100 Marks
Time: 01:00-04:00

PART - A

Answer any **FOUR** questions   **(4×10=40)**

1. Define relative velocity.

2. What are constraints? Give examples.

3. State Newton's law of gravitation.

4. What is gravitational red shift?

5. Why mercury does not wet the surface of glass?

6. Draw the circuit of an inverting amplifier and give its output voltage.

7. What is a flip flop?

8. State the basic postulates of Einstein's special theory of relativity

PART - B

Answer any **THREE** questions   **(3×20=60)**

9. Obtain an expression for the escape velocity of an object projected from the surface of the earth and hence show that the escape velocity from the surface of the earth is equal to 11.2 km/s.

10. What are constraints? Explain the different types of constraints with an example.

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

12. With a neat diagram, explain the working of inverting operational amplifier.

13. Define young's modulus, rigidity modulus and bulk modulus. Obtain the relation connecting the three elastic moduli of elasticity.

(a) State and explain Newton's law of gravitation.

(b) How would you find the mass and density of earth using Newton's law of gravitation?

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