No. of Printed Pages : **2**

21BSC1C1PHL(46128)

B.Sc. I Semester Degree Examination, April/May - 2024

PHYSICS

01 : Mechanics and Properties of Matter

(NEP)

Time : 2 Hours Maximum Marks : 60

Note : *(i) Answer **all** the sections.*

(ii) Non-Programmed Scientific Calculators are allowed.

SECTION - A

I. Answer the following sub-questions. Each sub-question carries **one** mark. **10x1=10**

1. (a) Give an example for Non-inertial frame of reference.
(b) What is Coriolis force ?
(c) Define centre of mass.
(d) State Law of Conservation of angular momentum.
(e) State Perpendicular axes theorem.
(f) Write an expression for moment of inertia of a circular disc about its diameter.
(g) State Hooke's Law.
(h) Define Young's modulus of a material.
(i) Define force of Cohesion.
(j) What is Streamline flow ?

SECTION - B

II. Answer **any four** of the following questions. Each question carries **five** marks. **4x5=20**

2. Derive an expression for length contraction.

3. Deduce an expression for variation of mass with velocity.

4. Discuss conservation of energy in the case of motion of a body near the surface of the earth.

5. Derive an expression for moment of inertia of a rectangular Lamina about an axis passing through its centre and parallel to one of its side.

6. Deduce an expression for couple per unit twist of a cylinder.

7. State and prove Stoke's Law.

P.T.O.

SECTION - C

III. Answer **any three** of the following questions. Each question carries **ten** marks. **3x10=30**

8. Describe Michelson-Morely experiment with neat diagram and discuss Negative Results. **10**

9. (a) State and Prove Law of Conservation of linear momentum of a system of particles. **5**

(b) Calculate the angular momentum of disc whose rotational energy is 10 KJ and moment of inertia about the axis of rotation is 8×10^{-4} kg m^2. **5**

10. (a) Derive an expression for moment of a hollow cylinder about an axis passing through its centre and perpendicular to its own plane. **5**

(b) State and Prove Parallel axes theorem. **5**

11. (a) What is Torsional pendulum ? Give the theory of Torsional pendulum. **5**

(b) Derive an expression for workdone in twisting a wire. **5**

12. (a) Derive the expression for exess pressure on the curved surface of a liquid. **8**

(b) Give any two differences between streamline flow and turbulent flow. **2**

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