

B.Sc. Semester - 1 (NEP-2020) Examination

OCT/NOV-2024

PHY: Mechanics and Optics (Major-2)

Time: 2:00 Hours

Marks: 50

Instructions:

1. All questions are compulsory.
2. Figures to the right indicate marks.

Que.1 Answer any two questions out of three. (10)

- (A) Write the laws of motion and prove work energy theorem
- (B) Define angular momentum and torque and Prove $\tau = I\alpha$ and $L = I\omega$
- (C) Write in detail: 1) conservation of angular momentum
2) Two theorem of moment of inertia.

Que.2 Answer any two questions out of three. (10)

- (A) Write a note on Michelson Morley experiment.
- (B) Write a note on time dilation and length contraction.
- (C) Describe Lorentz transformation and prove mass energy relation.

Que.3 Answer any two questions out of three. (10)

- (A) Write difference between Fresnel and Fraunhofer diffraction.
- (B) Explain the diffraction by double slit.
- (C) Write in detail zone plate and action of zone plate.

Que.4 Answer any five questions out of nine. (10)

- (A) Define conservative and non conservative forces.
- (B) Define potential energy and centre of mass
- (C) Define angular velocity and angular momentum.
- (D) Explain relativity of simultaneity.
- (E) Explain variation in mass with velocity.
- (F) Define galilean transformation.
- (G) Define diffraction and write it's types.
- (H) Write in short : Diffraction Grating
- (I) Explain Fraunhofer diffraction at single slit.

Que.5 Answer any two questions out of three. (10)

- (A) Define potential energy and explain conservation of energy.
- (B) Discuss addition of velocity in terms of relativity.
- (C) Discuss rectilinear propagation of light and half period zones.
