QP Code: D 112415	Total Pages: 2	Name:
		Register No.

FIRST SEMESTER UG DEGREE EXAMINATION, NOVEMBER 2024
(CUFYUGP)
APH1MN101/**PHY1MN101 – Mechanics and Optics**
2024 Admission onwards

Maximum Time :2 Hours	Maximum Marks :70

Section A
All Questions can be answered. Each Question carries 3 marks (Ceiling : 24 Marks)

1	Can an object be in equilibrium when only one force acts on it? Explain.
2	A teacher swings a rubber stopper at the end of a string in a horizontal circle in front of his class. He tells a student that he will let the string go when the stopper is directly in front of her face. Should the student worry? Explain your answer.
3	Distinguish between conservative and non-conservative forces with one example for each.
4	Find the work done in case of a variable force problem.
5	Distinguish between Fresnel and Fraunhofer diffraction.
6	What are the fundamental forces in nature?
7	Draw and explain the intensity distribution curve for the diffraction pattern obtained by a straight edge.
8	Distinguish between prism spectra and grating spectra with minimum three distinguishing points.
9	Explain why a thin film appears bright in reflected light and dark in transmitted light.
10	Interference fringes exhibit alternate dark and bright fringes. Explain the darkness based on the Superposition principle.

Section B
All Questions can be answered. Each Question carries 6 marks (Ceiling : 36 Marks)

11	Differentiate between kinetic friction and static friction with one example for each.
12	Show that the apparent weight of a person a) will increase when he is in a lift which is accelerating upward, b) will decrease when he is in a lift which is accelerating downward and c) remain same as actual weight in a uniformly moving lift.
13	Show that total mechanical energy is conserved when a particle is moving under the influence of a conservative force.
14	A 200 kg wardrobe is lifted by three persons to a height of 1 meter in 5 minutes. Calculate the power of each person.
15	Briefly explain the four fundamental forces in nature.

16	What is the highest order spectrum which may be seen with a light of wavelength 500 nm by means of a grating with 3000 lines per cm?
17	Two coherent light sources, whose intensity ratio is 9:4, produce interference fringes. Deduce the ratio of maximum to minimum intensity of the fringe system.
18	A man of height 169 cm is standing at 30.0 cm to the left of a plane mirror. (a) where will the image of the man be formed and (b) what will be the height of the image?
Section C	
Answer any ONE .Each Question carries 10 marks (1x10=10 Marks)	
19	Explain interference of two coherent sources. Derive an expression for fringe width. Draw the intensity pattern
20	Explain work energy theorem. Show that the sum of Kinetic energy and potential energy remains constant for a particle dropped from a height h and falling freely under gravity (neglect air resistance).