



Term Evaluation (Even) Semester Examination March 2025

Roll no.....

Name of the Course: DIPLOMA

Semester: II

Name of the Paper: APPLIED PHYSICS II

Paper Code: DTPH 202

Time: 1.5-hour

Maximum Marks: 50

Note:

- (i) Answer all the questions by choosing any one of the sub-questions
- (ii) Each question carries 10 marks.

Q1.

[CO1] (10 Marks)

a. Discuss the characteristics of transverse and longitudinal waves in terms of their propagation. Define the terms, amplitude, time-period and wavelength. Derive the mathematical relationship between frequency and wavelength.

OR

b. State the necessary conditions for the motion to be classified as simple harmonic motion (SHM). Derive the expression for velocity and time-period in SHM. For the equation $y = 0.2 \sin(50\pi t)$, determine the amplitude, frequency and time-period of oscillation.

Q2.

[CO1] (10 Marks)

a. Define reverberation time and explain its significance in acoustics. Derive the formula for the coefficient of absorption of sound. Compare and contrast the principles and applications of SONAR and RADAR.

OR

b. A particle executes, simple harmonic motion of amplitude 25 cm and time-period 3 seconds. What is the minimum time required for the particle to move between two points 12.5 cm on either side of the mean position?

Q3.

[CO2] (10 Marks)

a. Elaborate on the phenomena of reflection and refraction of light. State the laws of refraction and define the refractive index with its mathematical expression. Explain the physical significance of refraction.

OR

b. Distinguish between real and virtual images. Define linear magnification and provide its formula. Explain the concept of power of lens, including its formula and unit.

Q4.

[CO2] (10 Marks)

a. Identify and explain two common defects in image formation by lenses. Discuss the methods to correct these defects. State the lenses formula.

OR

b. A convex lens forms an image 16.0 cm long of an object 4.0 cm long kept at a distance 6 cm from the lens. The object and the image are on the same side of the lens.

- (i) What is the nature of image?
- (ii) Find the position of the image.
- (iii) Find the focal length of the image

Q5.

[CO2] (10 Marks)



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a. Describe the conditions required for total internal reflection to occur. Derive the relationship between the critical angle and the refractive index and provide examples of practical applications of total internal reflection.

OR

b. A compound microscope consist of an objective lens of focal length 2.0 cm and an eyepiece of focal length 6.25 cm separated by a distance of 15 cm. How far from the objective should an object be placed to obtain the final image at at (i) the least distance of distinct vision ($D = 25$ cm) and (ii) infinity. What is the magnifying power of the microscope in each case?