Graphic Era
HILL UNIVERSITY
Established by an Act of the State Legislature of Uttarakhand (Acharyam Sankhya 12 of 2011)
University under section 2(f) of UGC Act, 1956

Term Evaluation (Odd) Semester Examination September 2025

Roll No:.....

Name of the Course: B.Tech
Semester: I
Name of the Paper: Engineering Physics
Paper Code: TPH101

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. (10 Marks, CO1)
a. Describe the geometrical features of Fresnel's biprism. How can it be used to find the wavelength of light ?

OR

b. Light of wavelength 6000 $\AA$ falls normally on the wedge shaped film of refractive index 1.4 forming fringes that are 2.0 nm apart. Calculate the angle of the edge.

Q2. (10 Marks, CO1)
a. What are coherent sources? what are the conditions for two sources to be coherent ? can two independent sources become coherent?

OR

b. Two coherent sources whose intensity ratio is 81:1 produce interference fringes. Deduce the ratio of maximum to minimum intensity in fringe system.

Q3. (10 Marks, CO1)
a. Sketch the schematic diagram of the experimental setup of Newton's Ring experiment. Explain the conditions for constructive and destructive interference in reflected light.

OR

b. In an experiment, the diameters of the 8^{th} and 20^{th} dark rings of Newton's rings are measured as $D_8 = 2.4$ mm and $D_{20} = 4.0$ mm respectively.

(i). Determine the wavelength of the light used. (if R=100 cm)

Q4. (10 Marks, CO1/CO2)
a. How many types of diffractions are there ? Distinguish between all types of diffraction.

OR

b. Calculate the thickness of quarter-wave plate and half wave plate Given:

$$n_e = 1.553, \quad n_o = 1.544, \quad \lambda = 5000\AA$$

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Q5. (10 Marks, CO2)

a. Write a short note
(i) Polarised and unpolarised light,
(ii) Double refraction,
(iii) Quarter and Half wave plate,
(iv) e-ray and o-ray

OR

b. A beam of plane-polarized light with intensity $I_0 = 10\ W/m^2$passes through a polarizer.

(i). Find the intensity of transmitted light if the angle between the light's plane of polarization and the axis of the polarizer is $\theta = 30°$.

(ii). At what angle θ will the transmitted intensity be half of the original intensity I_0?