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Mid-Term Examination, Odd Semester 2021-22

B. Tech. (Hons.) CS, I-Year, I-Semester

BPHS 0004: Engineering Physics

Time: 2 Hours **Maximum Marks: 15**

Section – A

Note: Attempt All Three Questions. **(3x1=3)**

I. How does an antireflection coating on Camera lenses work?

II. Two polaroids are adjusted so as to obtain maximum intensity. Through what angle should one Polaroid be rotated to reduce the intensity to (i) half (ii) one fourth?

III. In Single slit diffraction, by what fraction is the Intensity of first secondary maximum reduced in comparison to that of the principle maximum?

Section – B

Note: Attempt All Three Questions. **(3x2=6)**

I. A single slit diffraction pattern is formed using white light. For what wavelength of light does the second order minimum coincide with the third minimum for wavelength 400 nm.

II. Why is the center obtained dark in Newton's Rings Experiment in Reflected light? How can the center in Newton's ring experiment obtained bright in reflected light?

III. In Fresnel's biprism, bands of 0.02 cm in width are observed on the screen at a distance of 100 cm from the slit. A convex lens is

then put between the observer and the biprism so as to give an image of the source at a distance of 100 cm from the slit. The distance between the images formed by convex lens is found to be 0.77 cm, the lens being 30 cm from the slit. Calculate the wavelength of light source used in experiment.

Section – C

Note: Attempt Any Two Questions. **(2x3=6)**

I. (i)What is the grating element if there are 10000 lines on grating of 2.5 cm.

(ii) Which order spectra are missing in Grating Spectrum? Which particular spectra would be absent if the width of transparent and opaque regions of the grating is equal?

II. Explain the Newton's rings method to determine the wavelength of monochromatic light source in reflected light and discuss which source is preferred - a point source or extended source.

III. A thin film of refractive index μ is illuminated by white light at an angle of incidence i. In reflected light, two consecutive bright fringes of wavelengths λ_1 and λ_2 are found overlapping. Obtain an expression for the thickness of the film.