D 50692 **(Pages : 2)** **Name.....**

Reg. No.....

FIFTH SEMESTER (CBCSS–UG) DEGREE EXAMINATION, NOVEMBER 2023

Physics/Applied Physics

PHY 5B 08/APH 5B 08—OPTICS

(2019 Admission onwards)

Time : Two Hours Maximum : 60 Marks

The symbols used in this question paper have their usual meanings.

Section A – Short Answer Type

Answer **all** *questions in two or three sentences, each correct answer carries maximum of* 2 *marks.*

1. What is law of refraction ?
2. According to sign convention how distances are measured ?
3. Define a thin lens If the thickness is very small compared to the object and image distances, radii of curvature.
4. Define first focal length.
5. Define lateral magnification.
6. Define Bragg wavelength.
7. Give the equation for angular divergence of diffraction of a circular aperture.
8. Differentiate Fresnel and Fraunhofer diffractions.
9. Define resolving power.
10. What is a polaroid ?
11. Define analyser.
12. List the requirements of holography.

(Ceiling 20)

Section B – Paragraph / Problem type

Answer **all** *questions in a paragraph of about half a page to one page, each correct answer carries a maximum of* 5 *marks.*

13. Explain any four postulates of sign convention
14. For an interference pattern ,find the ratio of intensity at P to that at maximum such that path difference S2P - S lP = $\lambda/3$.

Turn over

15. In Young's double hole experiments, the distance between two holes is 0.5 mm, $\lambda = 5 \times 10^{-5}$ cm and D = 50 cm. What will be the fringe width ?

16. Explain maxima and minima in an N slit Fraunhofer diffraction

17. What is a zone plate. Explain

18. Define and explain Huygen's explanation of double refraction

19. Explain holography in diverse fields.

(Ceiling 30)

Section C – Essay type

Essays – Answer in about two pages, any **one** *question.*
Answer carries 10 *marks.*

20. Write and explain the Gaussian formula for a single spherical surface. With figure explain the reflection by a single spherical surface.

21. In interference, derive the mathematical expressions for the reflected waves. Derive the rigorous expressions for reflectivity.

(1 × 10 = 10 marks)