

Total No. of Printed Pages: 2

SUBJECT CODE NO: - YY-2339
FACULTY OF SCIENCE AND TECHNOLOGY
B.Sc. F.Y (Sem-II)
Examination March / April - 2023
Physics Paper-IV
Optics Paper

[Time: 1:30 Hours]

[Max. Marks: 40]

Please check whether you have got the right question paper.

N. B

- i) All questions are compulsory.
- ii) All questions carry equal marks
- iii) Draw neat diagrams and give labels wherever necessary.
- iv) Figures to the right indicate full marks.

Q1 Obtain an equivalent focal length of the coaxial lens system of two lenses separated by a certain distance and obtain the positions of principal planes. 10

OR

Explain in brief

10

- i) Ramsden's eyepiece.
- ii) Focal length of the field lens in Huygens eyepiece is 3 cm. find the focal length of the eye lens, the distance between two lenses, and the equivalent focal length of the eyepiece.

Q2 Describe the principle, construction, and working of Michelson's Interferometer. 10

OR

Explain in brief

10

- i) Brewster's law.
- ii) Find the Specific rotation of sugar solution if 20% sugar solution is taken in the sample tube of length 20 cm and optical rotation is found to be 23.5 degrees.

Q3 Write a short note on (any two) 10

- i) Principal focus points
- ii) Huygens Eyepiece
- iii) Resolving power of Grating
- iv) Nicol Prism.

Q4 Multiple Choice Questions

- In geometrical optics a ray of light is shown by
(a) A straight line (b) A directed straight line (c) A sine wave (d) triangular wave
- There are _____ Cardinal points belonging to an optical system
(a) 2 (b) 4 (c) 6 (d) 8
- In Huygens eyepiece focal lengths of two lenses are $3f$ and f , the distance between them is _____.
(a) f (b) $2f$ (c) $3/4 f$ (d) $2/3 f$
- The bending of the beam of light around the corners of an obstacle is called as
(a) diffraction (b) interference (c) polarization (d) dispersion
- In the Newtons rings the fringe width _____ with the increasing number of orders.
(a) decreases (b) increases (c) remains unchanged (d) none of these
- Grating element for plane transmission grating is _____.
(a) a (b) b (c) $a-b$ (d) $a + b$
- In the Nicol prism two sections of calcite crystal are cemented together by _____.
(a) Canada balsam (b) Orient cement (c) Quartz material (d) Birla Gold.
- Two lenses of focal lengths f_1 and f_2 are separated by distance d , if f is the equivalent focal length of combination, then the distance of the first principal point from the first lens is 3
(a) $\frac{fd}{f_1}$ (b) $-\frac{fd}{f_1}$ (c) $\frac{fd}{f_2}$ (d) $-\frac{fd}{f_2}$
- The plane of polarization is that plane in which
(a) Vibration occurs (b) Vibrations do not occur
(c) Circular vibrations occur (d) elliptical vibrations occur
- The radius of the 20th Newton's ring if the incident light is having a wavelength of 600 nm , the radius of curvature of the lens is 10.08 m
(a) 0.011 m (b) 11 m (c) 0.011 cm (d) 11 cm