Total No. of Printed Pages: 2

**SUBJECT CODE NO:- B-2025**
**FACULTY OF SCIENCE & TECHNOLOGY**
**B.Sc. F.Y. (Sem-II)**
**Examination November/December- 2022**
**Physics Paper- IV**
**Geometrical & Physical Optics**

**[Time: 1:30 Hours]** **[Max. Marks:50]**

Please check whether you have got the right question paper.

N.B
1. Attempt all questions.
2. Use of logarithmic table and electronic pocket calculator is allowed.

Q.1 a) Explain co-axial system for equivalent focal length and determine its cardinal points. 10

b) Explain the phenomenon of reflection of light in thin film due to transmitted light. 10

**OR**

c) Explain Fraunhofer diffraction at double slit. 10

d) Discuss Fresnel theory of optical rotation. 10

Q.2 a) Write a note on Ramsden's eyepiece. 05

b) Two thin convex lens having focal lenses 5cm and 2cm are co-axial and separated by a distance of 3cm. find the equivalent 05

c) Write a note on resolving power of prism. 05

d) A plane transmission diffraction grating has 40,000 lines. Determine its resolving power in the second order for the wavelength of 6000 Å 05

**OR**

a) Give the theory of Newton's ring. 05

b) In Michelson's interferometer 200 fringes cross the field of view. When the movable mirror is moved through 0.0589 mm. calculate the wavelength of light used. 05

c) Write a note on optical activity. 05

d) A 20 cm long tube containing sugar solution rotates the plane of polarization by $11^0$. If the specific rotation of sugar in $66^0$. Calculate the strength of the solution. 05

Q.3 Multiple choice questions. 10

1) In Ramsden's eyepiece the distance of first focal point from the field lens is given by
   a) $\frac{3}{2}$f  b) $-\frac{f}{4}$  c) $\frac{-3}{2}$ f  d) $\frac{f}{4}$

2) The lens used in Huygens eyepiece ----------
   a) Convex  b) Concave  c) Plano convex  d) Concave Plano

3) Newton's rings are due to ---------
   a) Polarization  b) Diffraction  c) Interference  d) Double refraction

4) Interference of two light waves is constructive if two waves are --------
   a) In same phase  b) In opposite phase
   c) Perpendicular to each other  d) None of the above

5) R.P. of prism is --------
   a) $\frac{1}{t}\frac{d\mu}{d\lambda}$  b) $t.\frac{d\mu}{d\lambda}$  c) $\frac{1}{t}\frac{d\lambda}{d\mu}$  d) $t.\frac{d\lambda}{d\mu}$

6) Grating element of plane transmission grating is
   a) a  b) b  c) (a + b)  d) a-b

7) If light is incident along optic axis then phenomenon of double refraction is ------
   a) Absent  b) Present  c) Doubled  d) Tripled

8) In Lorentz half-shade polarimeter source of light used is ----------
   a) Mono-chromatic  b) Chromatic  c) Continuous  d) Gamma-ray

9) Colours of thin film result from ----------
   a) Dispersion of light  b) Interference of light
   c) Absorption of light  d) Scattering of light

10) The plane of polarization is that plane in which ----------
   a) Vibration occurs  b) Vibration does not occurs
   c) Circular vibration occurs  d) Elliptical vibration occurs