Total No. of Printed Pages:2

**SUBJECT CODE NO:- 2025**
**FACULTY OF SCIENCE AND TECHNOLOGY**
**B.Sc. F.Y (Sem-II)**
**Examination March/April-2022 (To Be Held In June/July-2022)**
**Physics Paper- IV**
**Geometrical & Physical Optics**

**[Time:1:53 Hours]** **[Max. Marks:50]**

Please check whether you have got the right question paper.

N.B. i) Attempt all questions.
ii) Use of logarithmic table and Electronic pocket calculator is allowed.

Q.1 a) Explain with the help of neat diagram the construction and working of Huygen's eyepiece. 10
b) Describe the principle, construction and working of Michelson's interferometer. 10

OR

c) Derive an expression for resolving power of prism. 10
d) Explain in detail Lorentz half shade polarimeter. 10

Q.2 a) Write a short note on cardinal points of an optical system. 05
b) The focal length of lenses of Ramsden's eyepiece in 8 cm. Determine the equivalent focal length. (Given $f_1 = f_2 = 8$ cm). 05
c) Explain resolving power of grating. 05
d) Deduce the missing orders for a double slit fraunhofer diffraction pattern if the slit width are 0.16mm and they are 0.8mm apart. 05

OR

a) Write a short note on types of fringes of Michelson's interferometer. 05
b) In a Newton's rings experiment, the diameter of $10^{th}$ dark ring due to wavelength 6000 Å in air is 0.5cm. Find the radius of curvature of the lens. 05
c) Explain Huygen's theory of double refraction in uniaxial crystal. 05
d) Find the specific rotation of given sample of sugar solution if the plane of polarization is turned through 13.2°, the length of the tube containing 10% sugar solution in 20cm. 05

Q.3 Multiple Choice Question 10

1) In lens system the numbers of Cardinal points are
a) 2 b ) 4 c) 6 d) 8

2) In Huygen's eyepiece focal length is 5 cm then distance between two lenses is ……cm.
a) 5 b) 10 c) 15 d) 20

3) The soap film appears colorful due to
(a) Interference (b) Diffraction
(c) Reflection (d) Refraction

4) In Newton's ring by reflected light the $5^{th}$ radius of dark ring is
   (a) $r = \sqrt{S\lambda R}$ (b) $r = \sqrt{n\lambda R}$
   (c) $r = n\lambda R$ (d) $r = \sqrt{(2n-1)\lambda R}$

5) The bending of beam of a light around corners of an obstacle is called
   (a) Interference (b) Diffraction
   (c) Dispersion (d) Polarization

6) If there are $5 \times 10^4$ number of lines on the grating surface then R.P. of grating for the $I^{st}$ order is ……
   a) $2 \times 10^{-5}$m b) $2 \times 10^{5}$m c) $5 \times 10^{5}$m d) $5 \times 10^{4}$m

7) Light transmitted by a single Nicol prism is ……..
   (a) Plane polarized (b) Unpolarized
   (c) Circularly polarized (d) Elliptically polarized

8) The velocity of extra ordinary ray inside calcite crystal is …….
   a) Higher than that of ordinary ray in the Crystal.
   b) Lower than that of ordinary ray in the crystal.
   c) Equal to that of ordinary ray in the crystal.
   d) None of these

9) The R.I. of Canada balsam is
   a) 1.5 b) 2 c) 1.55 d) 1.25

10) Resolving power of transmission grating is
   a) $n\lambda$ b) nN c) $n/\lambda$ d) $n/N$