Seat Number

NOV-2016

* 0 5 8 3 *

काळ - 032

PHYSICS PAPER - II : PHY – 242
Optics (24126)

P. Pages : 3

Time : Two Hours

Max. Marks : 40

Instructions to Candidates :

1. Do not write anything on question paper except Seat No.
2. Graph or diagram should be drawn with the black ink pen being used for writing paper or black HB pencil.
3. Students should note, no supplement will be provided.
4. All questions are compulsory and carry equal marks.
5. Figures to the right indicates full marks
6. Draw neat diagrams wherever necessary.
7. Use of logarithmic table or electronic calculator is allowed.

1. Attempt **any eight** of the following. 8

i) A convex lens of focal length 2 meter has a power of---------.

a) 2 diopter
b) $\frac{1}{2}$ diopter
c) 1 diopter
d) $\frac{1}{4}$ diopter

ii) Newton's rings are fringes of ----------.

a) Equal inclination
b) Equal thickness
c) unequal thickness
d) Equal chromatic order

iii) A grating was first constructed by----------.

a) Newton
b) Rayleigh
c) Fraunhofer
d) Fresnel

iv) Polarimeter is an instrument used for the study of----------.

a) Light intensity
b) Optical activity
c) Refractive index
d) None of these

v) If two lenses having focal lengths f_1 & f_2 are kept in contact, then the focal length of the combination is given by----------.

a) $f = f_1 + f_2$
b) $f = f_1 - f_2$
c) $\frac{1}{f} = \frac{1}{f_1} + \frac{1}{f_2}$
d) $\frac{1}{f} = \frac{1}{f_1} - \frac{1}{f_2}$

vi) In Michelson interferometer, if the 2 mirrors M_1 & M_2 are perfectly perpendicular then----------.
a) Circular fringes are observed.
b) Straight line fringes are observed.
c) Fringes are not observed.
d) None of these.

vii) The bending of light at the corners of an obstacles is called as----------.
a) Refraction
b) Interference
c) Diffraction
d) Polarization

viii) Nicol prism is made from----------.
a) Quartz crystal
b) Calcite crystal
c) Diamond crystal
d) Nacl crystal

ix) In positive crystal, the velocity of extraordinary ray V_e and velocity of ordinary ray V_o can be related as----------.
a) $V_e > V_o$
b) $V_e < V_o$
c) $V_e = V_o$
d) $V_e = 1+V_o$

x) The wavelength of light determined by Newton's ring experiment is given by----------.
a) $\lambda = \frac{Dm - Dn}{4R(m-n)}$
b) $\lambda = \frac{D^2m - D^2n}{4R(m-n)}$
c) $\lambda = \frac{D^2m - D^2n}{4R}$
d) $\lambda = \frac{D^2m - D^2n}{4(m-n)}$

2. Attempt **any four** of the following. 8
a) On which principle the interferometer depends?
b) What is the condition for minimum spherical aberration.
c) What is the condition to obtain straight line fringes in Michelson interferometer.
d) What do you mean by Coherent Source?
e) Define the term unpolarized light.
f) Define resolving power of grating.

3. Attempt **any two** of the following. 8
a) How will you determine the refractive index of liquid using Newton's ring.
b) Distinguish between Fresnel's diffraction and Fraunhofer diffraction.
c) Distinguish between ordinary ray & extraordinary ray.

4. a) Attempt **any two** of the following. 6

i) Explain the construction of Nicol prism.

ii) Discuss circularly polarized light.

iii) Draw the ray diagram to explain axial chromatic aberration.

b) Define Burnt corner of the crystal. 2

5. a) Attempt **any one** of the following. 6

i) Explain Rectilinear propagation of light.

ii) What is Achromatism? Explain Achromatic Combination of two lenses in contact.

b) What do you mean by optical Centre of a lens. 2

****