V. P. & R. P. T. P. SCIENCE COLLEGE

Date: 30-09-2013 B. Sc. SEMESTER III Total Marks: 30

Monday PHYSICS Time: 1.00p.m. to 2.30p.m.

US03CPHY01

Note: i) Number to the right indicate marks.
ii) Draw the diagram where it is necessary

Q1 Multiple Choice Questions: Answer the following questions with the most correct choice. 6

i) In Fraunhoffer diffraction the source of light and screen are effectively at _____ distances from the obstacle.
i) infinite, ii) equal, iii) finite , iv) a greater

ii) The Fabry perot interferometer is a _____instrument, which make use for the fringes of equal inclination.
i) high pressure power , ii) high magnifying power ,
iii) high resolving power , iv) high visual power

iii) For a given lens, the refractive index for violet light is _____ than that for red light.
(a) negative (b) less
(c) positive (d) more

iv) The peripheral (marginal) light rays passing through a lens come to focus_____ the lens after refraction
(a) away from (b) close to
(c) on (d) at infinity

v) When $\delta = \pi/2$ between the two waves, and amplitudes are unequal then the resultant wave is _____ polarized wave .
(a)circularly (b) elliptically
(c) plane (d) straight line

vi) The intensity of transmitted light through the polarizer is _____ the intensity of incident light.
(a) half (b) double
(c) equal (d) zero

Q2 Answer in short – any **three** of the following 6

a) A coaxial lens system placed in air has two lenses of focal lengths 3F and F, separated by a distance 2F, determine the position of α and β.

b) Mention the properties of nodal points.

c) Give the comparison between the fringes produced by biprism and Lloyd's mirror.

d) Explain how the fringe width β is determined in the case of biprism?

e) State Malus law.

f) Mention the methods for producing the linearly polarized light.

Q3 Discuss spherical aberration of a lens? What are longitudinal and lateral spherical aberration? Also mention the methods of removing them. 6

OR

Q3 Give the construction and working of a Ramsden eyepiece? Mention its merits and demerits. Mention any two comparison of Ramsden and Huygens eyepiece. 6

Q4 What is diffraction ? Write a note on " Diffraction due to a narrow wire". Draw the geometric shadow for narrow wire and a thick wire. 6

OR

Q4 Explain the theory of Newton's ring . Discuss how the wavelength of given source can be determined by using Newton's ring experiment. 6
In Newton's rings experiment the diameter of 5^{th} ring was found to be 0.336cm. and the diameter of 15^{th} ring = 0.590cm, Determine the radius of curvature of the plano -convex lens, if the wavelength of light used is 5890 Å.

Q5 What is double refraction? Mention the name of two such crystals. Explain the Huygen's theory for double refraction in uniaxial crystal. 6

OR

Q5 Explain the superposition of waves linearly polarized at right angles. Also discuss the resultant wave for the phase difference (i) $\delta=0$ and (ii) $\delta = [\pi / 2]$ 6

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