Registration no:

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FPYC202

2nd Semester Regular / Back Examination – 2016-17
Optics(Geometrical &Physical Optics)
BRANCH(S): Int. M.Sc. (AP)
Time: 3 Hours
Max Marks: 70
Q.CODE:Z790
Answer Question No.1 which is compulsory and any five from the rest.
The figures in the right hand margin indicate marks.

Q1   **Answer the following questions:**   (2 x 10)
   a)   Why is interference not possible by two incoherent light sources?
   b)   What are the conditions of interference ?
   c)   What is the radius of the first zone in a zone plate of focal length 20 cm
        for light of wavelength 5000 A^0 .
   d)   Write difference between O- ray and E- ray.
   e)   Define quarter wave plate.
   f)   Compare between Huygens's eyepiece and Ramsden's eyepiece.
   g)   How can you detect plane- polarised light?
   h)   Define plane of vibration.
   i)   Distinguish between Fresnel and Fraunhoffer diffraction.
   j)   Calculate the thickness of a half wave plate of quartz for a wavelength
        of 5000 A^0. Here μ_E = 1.553 and μ_O = 1.544.

Q2 a) Discuss the construction and working of Huygens'seyepiece. Obtain its   (5)
        cardinal points.
    b) Explain the term cardinal points with reference to a co-axial lens   (5)
        system.

Q3 a) Describe and explain the phenomenon of interference in thin film.   (5)
    b) Mention how circular, localized and white light fringes are obtained in   (5)
        Michelson interferometer.

Q4 a) Describe experimental set up and theory of Newton's ring. How can   (6)
        you determine the wavelength of light using this?
    b) In a Newton's rings experiment, the diameter of the 5th ring was 0.336   (4)
        cm and the diameter of the 15th ring = 0.59 cm. Find the radius of
        curvature of the Plano convex lens, if the wavelength of light used is
        5890 A^0 .   bput question papers visit http://www.bputonline.com

Q5 a) Explain about Fraunhofer diffraction due to a single slit and deduce the (5)
        positions of the maxima and minima.
    b) What is missing order spectra?   (5)

Q6 a) Explain the theory of resolving power of a microscope. (5)
    b) How would you distinguish between circularly and elliptically polarised light? (5)

Q7 a) What is a zone plate? Derive an expression to find its focal length. (6)
    b) State and explain the law of Malus. (4)

Q8 a) Show that when a ray is incident at the Brewster's angle the reflected ray is perpendicular to the refracted ray. (4)
    b) What is a Nicol prism? Describe its construction and working .Discuss how it can acts as a polarizer and analyser. (6)