

University Roll No.....

B.Tech. I Year, II Semester, I Mid. Term Examination, 2016-17

Engineering Physics (AHP 1101)

Time : 1 Hour 30 minutes

Total Marks : 20

## Section A

Note: Attempt all questions.

(1×5=5 Marks)

1. What is the important condition of coherent sources?
2. Due to which phenomenon the soapy water or thin films of oil show their brilliant colours?
3. In Young's double slit experiment the separation between the slits is halved, what would happen to the fringe width?
4. What should be the size of obstacle to get the best diffraction pattern?
5. Which optical phenomenon predicts the transverse nature of light?

## Section B

Note: Attempt any three questions.

(2×3=6 Marks)

1. In Young's double slit experiment the slits are 0.5mm apart and interference is observed on a screen placed at a distance of 100cm from the slits. It is found that 9th bright fringe is at a distance of 8.835mm from second dark fringe from the centre pattern. Find the wavelength of light used.

(P.T.O.)

2. In Newton's rings experiment the diameter of 6<sup>th</sup> and 10<sup>th</sup> dark rings are 0.40 cm and 0.80 cm respectively. Deduce the diameter of 20<sup>th</sup> dark ring.
3. Distinguish between Fresnel and Fraunhofer diffractions. Light of wavelength  $5500\text{\AA}$  falls normally on a slit of width  $22 \times 10^{-5}\text{cm}$ . Calculate the angle of diffraction for second order.
4. What is meant by specific rotation? The plane of polarisation of linearly polarised light is rotated through  $6.5^\circ$  in passing through a length of 2.0 dm of sugar solution of 5% concentration. Calculate the specific rotation of sugar solution.

## Section C

Note: Attempt any three questions.

(3×3=9 Marks)

1. Two coherent sources of intensity ratio 9 interfere. Find the value of  $(I_{\max} - I_{\min}) / (I_{\max} + I_{\min})$ .
2. Discuss the young's double slit experiment and obtain the expression for fringe width.
3. Drive the expression for intensity distribution due to Fraunhofer diffraction at a single slit. Find the conditions for maxima and minima
4. Discuss the fresnel's theory of rotatory polarisation and drive the formula for angle of rotation for the plane of vibration.