

**Mid Term Examination, Even-Semester, 2019-20**  
**for B.Tech I Year, Semester - II**

Subject Name : Engineering Physics

Subject Code: BPHS0001

Time: 2 Hours

Max. Marks: 30

**Section A****Note: Attempt all three questions.****3X2= 6**

1. Which are two important properties of coherent sources to get the sustainable interference pattern?
2. Distinguish between Fresnel and Fraunhofer classes of diffraction.
3. What is meant by specific rotation of polarized light? Express the specific rotation in terms of angle of rotation.

**Section B****Note: Attempt all three questions.****3X3= 9**

1. Two coherent sources of intensity ratio 9:1 interfere. Prove that

$$\frac{I_{\max} - I_{\min}}{I_{\max} + I_{\min}} = \frac{3}{5}$$

2. In Newton's rings experiment the diameter of 4<sup>th</sup> & 12<sup>th</sup> Dark Rings are 0.400 cm and 0.700 cm respectively. Deduce the diameter of 20<sup>th</sup> Dark Ring.
3. A parallel beam of sodium light is normally incident on plane diffraction grating have 4250 lines per cm and a second order spectral line is observed at angle of 30°. Find the wave length of light.

(P.T.O.)

**Section C****Note: Attempt any three questions.****3X5=15**

1. Define Fringe width. Drive the expression for Fringe width using Young's double slit theory of Interference.
2. Show that the diameter of Dark Rings in Newton's Ring experiment is proportional to the natural number.
3. Deduce the expression for resultant intensity of the principal maxima observed in a transmission diffraction grating experiments.
4. Write the Maxwell's equations of Electromagnetic field applicable in free space. Using Maxwell's equations show that the EM waves travel with the speed of light in vacuum.