**Total No. of Questions : 4]**

**SEAT No. :** 

**PA-1679**

**[Total No. of Pages : 2**

# [5931]-1002
## F.E. (Common)
## ENGINEERING PHYSICS
## (2019 Pattern) (Semester - I) (107002)

***Time : 1 Hour]*** ***[Max. Marks : 30***

***Instructions to the candidates:***

1) ***Solve Q.1 or Q.2 and Solve Q.3 or Q.4.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Use of logarithmic tables, slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.***
5) ***Assume suitable data, if necessary.***

***Q1)*** a) What is Fraunhofer diffraction. State the equations for resultant amplitude and resultant intensity between the diffracted waves in Fraunhofer diffraction due to a single slit. State the conditions of maximum and minimum intensity. **[6]**

b) State and explain Malus law with proof. **[5]**

c) White light falls at an angle of 45° on a thin film of soap bubble having refractive index 1.33. At what minimum thickness of the film it will appear bright yellow of wave length 5896 A° in the reflected light. **[4]**

OR

***Q2)*** a) What is double refraction? Explain Huygen's theory of double refraction. **[6]**

b) What is interference of light? Explain the use of thin film as antireflection coating. **[5]**

c) What is the highest order spectrum that is visible with light of wavelength 6000 A° by means of grating having 5000 lines per centimeter. **[4]**

***P.T.O.***

***Q3)*** a) Explain the construction and working or a carbon dioxide laser. **[6]**

b) What are optical fibres? Distinguish between step index optical fibre and graded index optical fibre. (Any 4 pts) **[5]**

c) Calculate the numerical aperture and acceptance angle of an optical fibre having core refractive index 1.49 and cladding refractive index 1.44. **[4]**

OR

***Q4)*** a) What are optical fibres? Draw a neat labelled diagram of cross section of optical fibre showing total internal reflection. State the advantages of optical fibre communication over the conventional communication system. (Any 4 pts.) **[6]**

b) What is holography? Explain recording of a hologram using laser. **[5]**

c) What is LASER? State the important characteristics of LASER. **[4]**

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