Total No. of Questions : 4]

SEAT No. : [ ]

P2

[Total No. of Pages : 2

FE/Insem./APR - 2
F.E. (Common)
107002 : ENGINEERING PHYSICS
(2019 Pattern) (Semester - II)

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

Instructions to the candidates:

1) ***Solve either Q. No. 1. or Q. No. 2. and Q. No. 3. or Q. No. 4.***
2) ***Neat diagrams must be drawn whenever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Use of logrithmic tables slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.***
5) ***Assume suitable data, if necessary.***
6) ***All questions carry equal marks.***

Q1) a) Explain with neat diagram interference in thin parallel film in reflected system. calculate the total path difference. Obtain the condition of maximum and minimum. **[6]**

b) Explain with diagram how principle of interference is used to design antireflection coating. Derive the expression for thickness. **[5]**

c) Polarizer and Analyzer are adjusted in such a way that, they transmit maximum light. Calculate the angle of analyzer for which Intensity reduces
i) 2/3
ii) 1/5 of the original Intensity. **[4]**

OR

Q2) a) Define diffraction grating. How it is prepared? Calculate the angular width of central maximum, when it is diffracted from single slit of width 0.01 nm. $\lambda = 5500 A^{\circ}$. **[6]**

b) Define double refraction. Explain Huygen's theory of double refraction. **[5]**

c) Calculate the minimum thickness of a soap film which will appear dark and bright when it is illuminated by a light of wavelength 6000A° normally. Data given $\mu = 1.43$. **[4]**

P.T.O.

Q3) a) Describe construction and working of CO_2 LASER with the help of energy level diagram. **[6]**

b) Define critical angle, acceptance angle and numerical Aperture for optical Fibre. Explain different types of mode of fibre optics communication with diagram. **[5]**

c) Calculate the maximum value of angle of incidence such that light ray can travel through the fibre. Data given : $n_1 = 1.6$, $n_2 = 1.5$. **[4]**

OR

Q4) a) When light travels denser to rarer medium, calculate the critical angle for the medium. Define acceptance angle, acceptance cone and Numerical aperture. **[6]**

b) Explain applications of LASER in industry and medical field. Discuss any one of them in details. **[5]**

c) What is Hologram. Explain the process of reconstruction of Hologram with Diagram. **[4]**