

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 logarithmic 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) $\frac{2}{3}$
ii) $\frac{1}{5}$ 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. $\lambda = 5500\text{\AA}$. [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 6000\AA normally. Data given $\mu = 1.43$. [4]

P.T.O.

- Q3)** a) Describe construction and working of CO₂ 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]
