

Total No. of Questions : 4]

SEAT No. :

P-5368

[Total No. of Pages : 2

[6185]-51

F.E. (Common) (Insem)

ENGINEERING PHYSICS

(2019 Pattern) (Semester - I) (107002)

Time : 1 Hour]

[Max. Marks : 30

Instructions to the candidates:

- 1) Solve Q1 or Q2 and solve Q3 or Q4.
- 2) Neat diagram must drawn wherever necessary.
- 3) Figures to the right indicates full marks.
- 4) Assume Suitable data, if necessary.

Q1) a) Derive expression for path difference in reflected system for thin film of uniform thickness and obtain condition for maxima and minima. [6]

b) The resultant amplitude of wave when monochromatic light is diffracted from a single slit is  $E_{\theta} = E_m \left( \frac{\sin \alpha}{\alpha} \right)$  starting from this obtain the condition of principal maxima and minima. [5]

c) How should the polarizer and analyzer be oriented so that intensity of transmitted light becomes to i) 0.50 ii) 0.25 times the maximum intensity? [4]

OR

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

b) Explain the use of thin film as Antireflection coating along with equation of thickness of coating. [5]

c) In a plane transmission grating, the angle of diffraction for the second order principal maximum for wavelength  $5 \times 10^{-5}$  cm is  $30^{\circ}$ . Calculate the number of lines / cm of the grating surface. [4]

P.T.O.

- Q3)** a) Explain with neat labelled diagram construction and working of a carbon dioxide laser. [6]
- b) What is optic fibre? Give the difference between step Index and Graded Index optic fibre (any 2). [5]
- c) Calculate the numerical aperture and acceptance angle of an optical fibre having  $n_1 = 1.49$  and  $n_2 = 1.44$ . [4]

OR

- Q4)** a) Explain the process of fiber optics communication system with neat block diagram. State any two advantages of fiber optics communication. [6]
- b) What is Holography? Explain the process of hologram recording. [5]
- c) Describe the terms in laser : [4]
- i) Stimulated emission
  - ii) Pumping

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