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SCAN ME

Total No. of Questions : 4]

SEAT No.

P3

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[6007]-123

F.E. (Common) (Insem)

ENGINEERING PHYSICS

(2019 Pattern) (Credit System) (Semester-II) 002)

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

Instructions to the candidates:

1) *Answer Q1 or Q2, Q3 or Q4.*
2) *All questions carry equal marks.*
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) Derive an expression for path difference between the reflected rays in the interference of thin film of uniform thickness. Write the conditions of brightness and darkness. [6]

b) State Malus law. Prove it by using neat labelled diagram. [5]

c) In a grating spectrum, which wave length in spectral line of 4^{th} order will overlap with 3^{rd} order spectral line of wavelength 5491 Å. [4]

OR

Q2) a) What is double refraction? Draw a neat labelled diagram showing double refraction. Write any three distinguishing points between ordinary ray and extra-ordinary ray. [6]

b) What is plane diffraction grating? Write down the expression for resultant amplitude of diffracted waves through the plane diffraction grating explaining significance of each term. Write down the conditions for maximum intensity and minimum intensity. [5]

c) Find the angle of wedge in degree for a thin glass wedge of refractive index 1.52 with fringe specing 0.1 mm and wavelength or light is 5893 Å. [4]

P.T.O.

Q3) a) What is laser? State any three characteristics of laser. Explain in brief the resonant cavity with neat labelled diagram. **[6]**

b) What is optical fibre? State any four advantages of optical fibre communication over the conventional communication system. **[5]**

c) What is acceptance angle in optical fibre? A fibre cable has an acceptance ongle of 30° and a core index of refraction is 1.4. Calculate the refractive index of cladding. **[4]**

OR

Q4) a) Distinguish between step index optical fibre and graded index optical fibre. (Any three points).

Calculate the numerical aperture of an optical fibre having refractive index of 1.55 for care and refractive index of 1.50 for cladding. **[6]**

b) What is laser? Distinguish between spontaneous emission and stimulated emission. (any two points) **[5]**

c) What are reference beam and object beam in recording of a hologram. Explain in brief their role in recording of a hologram. **[4]**