Total No. of Questions : 4]

SEAT No. :

PF3

[Total No. of Pages : 2

APR-26/FE/Insem-3
F.E. (Common) (Insem)
ENGINEERING PHYSICS
(2019 Pattern) (Credit System) (Semester - II) (107002)

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

Instructions to the candidates:

1) ***Answer Q.1 or Q.2 and Q.3 or Q.4.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicates full marks.***
4) ***Assume suitable data if necessary.***

Q1) a) Derive an expression for condition of maxima and minima for reflected light in case of uniform thickness thin transparent film. **[6]**

b) What is diffraction of light? Distinguish between Fraunhofer and Fresnel diffraction. **[5]**

c) How should the polarizer and analyser be oriented to reduce the beam of light to 25% of its original intensity? **[4]**

OR

Q2) a) Obtain the condition for principal maximum and minimum in fraunhofer diffraction due to a single slit. **[6]**

b) Explain double refraction phenomenon with the help of Huygen wave theory. **[5]**

c) A glass microscope lens (μ=1.5) is coated with magnesium fluoride (μ_f=1.38) film to increase the transmission of normally incident light of wavelength 5800AU. What minimum film thickness should be deposited on the lens? **[4]**

P.T.O.

Q3) a) Describe principal, construction and working of CO_2 Laser. **[6]**

b) Define optical fibres. Explain step index fibre and graded index fibre. **[5]**

c) Calculate the numerical aperture and acceptance angle of an optical fibre. given : ($\eta_1 = 1.55$ and $\eta_2 = 1.50$) **[4]**

OR

Q4) a) Explain numerical aperture, acceptance angle and acceptance cone with required mathematical expression. **[6]**

b) What is holography? Explain the process of hologram recording. **[5]**

c) Explain : **[4]**

i) Population inversion

ii) Resonant cavity