



Mid Term (Odd) Semester Examination October 2024

Roll no.....

Name of the Course and semester: B. Tech, 1st Sem

Name of the Paper: Engineering Physics

Paper Code: TPH-101

Time: 1.5 hour

Maximum Marks: 50

Note:-

- (i) Answer all the questions by choosing any one of the sub questions.
- (ii) Each question carries 10 marks.

Q1.	(10 Marks)	CO/Cos
a)	Calculate the distance between two virtual coherent sources in Fresnel's biprism experiment using, (i) displacement method and (ii) deviation method.	1
	OR	
b)	The distance between the slit and biprism and between biprism and eyepiece are 45 cm each. The obtuse angle of biprism is 178° and its refractive index is 1.5. If the fringe width is 15.6×10^{-3} cm, find the wavelength of light used.	1
	OR	
Q2.	(10 Marks)	CO/Cos
a)	Why Newton's rings are circular? How can we use Newton's ring pattern to calculate the refractive index of a liquid?	1
	OR	
b)	The Newton's rings are seen in reflected light of wavelength 5896 \AA . The radius of curvature of plano-convex lens is 0.9 meter. An air film is replaced by a liquid whose refractive index is to be calculated under the conditions if 14 th ring and its diameter is 5.1 mm.	1
	OR	
Q.3	(10 Marks)	CO/Cos
a)	How does a single slit cause diffraction pattern? Derive the expression for the intensity in this case.	1
	OR	
b)	Find the angular width of the central bright maximum in the Fraunhofer diffraction pattern of slit of width 12×10^{-5} cm when the slit is illuminated by monochromatic light of wavelength 6000 \AA .	1
	OR	
Q.4	(10 Marks)	2
a)	Explain the phenomena of double refraction with the help of a suitable diagram. Also describe the difference between E-ray and O-ray.	2
	OR	
b)	The polarizer and analyzer are adjusted to obtain maximum transmitted intensity. Through what angle should the analyzer be rotated to reduce the intensity, (i) half and (ii) one fourth.	2
	OR	
Q.5	(10 Marks)	CO/Cos
a)	Explain the production of plane, circular and elliptical polarized light through mathematical equations.	2
	OR	
b)	Calculate the thickness of a calcite plate which would convert plane-polarized light into circularly polarized light. The principal refractive indices are $\mu_o=1.658$ and $\mu_e=1.486$ at wavelength 5890 \AA of light used.	2
	OR	