BE 1st Year 1st Test Jan 2021

Applied PhysicsACR2C2

(ETC B and E&I)

Time: 70 min **Max. Marks: 20**

Attempt any one part from each question.

Q1	**I (a)**	Explain the theory of Newton's ring and derive the expression for fringe spacing. Also explain why Newton's fringes are called fringes of equal thickness.	**8**
	(b)	What are similarities and dissimilarities in Zone plate and Conex lens. Find the radii of the first three transparent zones of a zone plate whose first focus at a distance 2 metre and wavelength of incident light is 6000Å.	**4**
		OR	
	II	Explain the double slit diffraction and derive the expression for maxima and minima. Also explain the missing order of interference maxima.	**8**
	(b)	Explain the use of compensating glass plate in Michelson's interferometer. In a Michelson interferometer, 100 fringes crossed file of view when the movable mirror is moved through a distance of 0.0295mm. Calculate the wavelength of the monochromatic light used.	**4**
Q2	**I(a)**	Explain the construction of Nicole prism. What is use of Canada balsam in construction of Nicol's prism	**5**
	(b)	What is half wave plate? If unpolarized light falls on two polarizing sheets placed one on top of other, what must be the angle between the characteristics directions of the sheet if the intensity of the transmitted light is 1/3 of the maximum intensity of the incident beam.	**3**
		OR	
	II(a)	Derive an expression for production of the circularly and elliptically polarized light.	**5**
	(b)	What is Polarimeter and why we can't use only polarizer and analyser as a polarimeter. A solution of dextrose of specific rotation is 52.5^{o}, causes a rotation of 12^{o} in a column 10 cm long. Find the concentration of the solution	**3**

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