

Name:	Printed Pages: 2
Student University Roll No.:	
<b>School of Engineering</b> <b>First Sessional Examination, Even Semester (AS: 2023-24)</b> <b>B. Tech: CSE ( 1A, 1B, 1C, 1D, 1E, 1F, 1G, 1H, 1I, 1J)</b> <b>Year: 1 Semester: 1</b>	
Course Title: Engineering Physics	M.M.: 30
Course Code: NBS 4102	Time: 1 hr.

**Instructions if any: Read the question Carefully.**

SECTION 'A'		Course Objective	Marks
Q.N.1. Attempt all parts of the following:			
a)	What do you mean by coherent sources?	CO1	1
b)	Define grating element.	CO1	1
c)	What do you mean by optic axis?	CO1	1
d)	Why the center of Newton's ring generally appears dark?	CO1	1
e) ✓	What is Diffraction of light?	CO1	1
SECTION 'B'		Course Objective	Marks
Q.N.2. Attempt any two parts of the following:			
a)	A thin film of soap solution is illuminated by white light at an angle of incidence, $i = \sin^{-1}(4/5)$ . In reflected light, two dark consecutive overlapping fringes are observed corresponding to wavelengths $6.1 \times 10^{-7} \text{ m}$ and $6.0 \times 10^{-7} \text{ m}$ . The refractive index for soap solution is $4/3$ . Calculate the thickness of the film.	CO1	7.5
b)	Newton's rings are observed in reflected light of wavelength $6000\text{\AA}$ . The diameter of the 10th dark ring is 0.50 cm. Find the radius of curvature of the lens and the thickness of the air film.	CO1	7.5
c)	Calculate the minimum number of lines in a grating which will just resolve the lines of wavelengths $5890\text{\AA}$ and $5896\text{\AA}$ in the second order.	CO1	7.5
d)	A sugar solution in a tube of 20 cm produces optical rotation of $13^\circ$ . The solution is then diluted to one-third of its previous concentration. Find optical rotation produced by 30 cm long tube containing the diluted solution.	CO1	7.5

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SECTION 'C'		Course Objective	Marks
Q.N.3. Attempt any one part of the following			
a)	Describe the formation of Newton's ring in reflected light. Prove that in reflected light the diameter of dark rings are proportional to the square root of natural numbers.	CO1	10
b)	Describe the Rayleigh's criterion for resolution. Derive an expression for the resolving power of grating.	CO1	10
c)	Describe the construction and working of a Nicol Prism. How it can be used as a polarizer and Analyzer?	CO1	10

**Table 1: Mapping between COs and questions**  
(Number of COs may vary from course to course)

COs	Questions Numbers	Total Marks
CO1	1a,1b,1c,1d,1e,2a,2b,2c,2d,3a,3b,3c	65

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