| Name:<br>Student University Roll No.: | Printed Pages: 2 |
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**School of Engineering**

**First Sessional Examination, Even Semester (AS: 2023-24)**

**B. Tech: CSE ( 1A, 1B, 1C, 1D, 1E, 1F, 1G, 1H, 1I, 1J)**

**Year:** 1 **Semester:** 1

| Course Title: Engineering Physics<br>Course Code: NBS 4102 | M.M.: 30<br>Time: 1 hr. |
|---|---|

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

| | **SECTION 'A'**<br>**Q.N.1. Attempt all parts of the following:** | **Course Objective** | **Marks** |
|---|---|---|---|
| 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'**<br>**Q.N.2. Attempt any two parts of the following:** | **Course Objective** | **Marks** |
|---|---|---|---|
| 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 x 10-7 m and 6.0 x 10-7 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 6000Å. 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 5890Å and 5896Å in the second order. | CO1 | 7.5 |
| d) | A sugar solution in a tube of 20 cm produces optical rotation of 13°. 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 |
| | | | |

| SECTION 'C'<br>Q.N.3. Attempt any one part of the following | | Course Objective | Marks |
|---|---|---|---|
| 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 |