ज्ञानेन प्रकाशते जगत्
INDUS UNIVERSITY

IITE, Indus University
Engineering Physics (PH0011)
Academic year: 2022-23 Semester:2 (2022 batch)
Assignment

Unit IV: Wave Optics and Laser

1. **Define the terms: (i) Interference (ii) Diffraction (iii) Stimulated Emission (iv) Spontaneous Emission (v) Absorption (vi) LASER (vii) Fringe width**
2. **Define Interference phenomena of light. and Explain Young's double slit experiment of Interference phenomenon of light using necessary diagram.**
3. **Obtain an expression for fringe width in case of Interference phenomena of light. Prove that in this case of interference dark and bright bands are of equal width.**
4. **Derive the condition for Maxima and minima intensity of light in case of Interference phenomenon of light.**
5. **Define Diffraction. Explain the types of diffraction phenomena of light with examples.**
6. **Differentiate Interference and Diffraction phenomena of light**
7. **State different characteristics of Laser.**
8. **Discuss the differences between Spontaneous emission and Stimulated emission.**
9. **What are Einstein Coefficients? Derive the relation between them for LASER.**
10. **List out the types of LASER. Describe the construction and working principle of solid state Laser (Nd-YAG Laser) along with necessary diagrams.**
11. **Discuss the various applications of LASER in the field of science and engineering.**

Numericals for practice:

12. **In a Young's double slit experiment , the slits are separated by 0.28 mm and the screen is placed 1.4 m away. The distance between the central bright fringe and the fourth bright fringe has been measured to be 1.2 cm. Determine the wavelength of light.**
13. **Two coherent sources are placed 0.2 mm apart and the fringes are observed on**

the screen 1 m away. It is found that with a certain monochromatic source of light, the fourth bright fringe is situated at a distance of 10 mm from the central fringe. Find the wavelength of light.

14. **Two coherent sources of monochromatic light of wavelength 6000 Å produce an interference pattern on a screen kept at a distance of 1 mm from them. The distance between two consecutive bright fringes on the screen is 0.5 mm. Find the distance between the two coherent sources.**

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