23BPH351

UG PROGRAM (4 YEARS HONORS) WITH SINGLE MAJOR
AT THE END OF THIRD SEMESTER
PHYSICS-OPTICS (Minor)
(w.e.f. Admitted Batch 2023-24)

Time: 3 Hours **Maximum: 70 Marks**

Section–A

Answer any Five Questions. **5x4=20**

1. What is coma? How is it eliminated?
2. What is the principle of superposition of waves?
3. Explain the resolving power of a grating.
4. State and explain Mauls law.
5. Explain population inversion.
6. Explain the concept of phase change on reflection (Stoke's law).
7. Write the difference between interference and diffraction.
8. Write short note on holography.

Section– B

Answer All Questions. **5x10=50**

9. a) Explain the concept of spherical aberration. Discuss various methods for minimizing spherical aberration in lenses.

(Or)

b) Explain chromatic aberration and the working principle of an achromatic doublet.

10. a) Describe the Fresnel's biprism method for the determination of the wavelength of light.

(Or)

b) Explain the principle, construction, and working of the Michelson interferometer.

11. a) Discuss Fraunhoffer diffraction due to a single slit. Explain the distribution of intensity of light in the diffraction pattern.

(Or)

b) Explain the concept of Fresnel's half-period zones and discuss the working of a zone plate

12. a) Explain various methods of producing polarized light.

(Or)

b) Describe the construction and working of a Nicol prism and explain its use as a polarizer and analyser.

13. a) Explain spontaneous and stimulated emission and derive the relation between Einstein's coefficients.

(Or)

b) Explain the construction and working of a ruby laser with energy-level diagram.

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