

Exam. Code : 103203

Subject Code : 1304

B.A./B.Sc. 3rd Semester

PHYSICS

Paper—B (Optics and Lasers)

Time Allowed—3 Hours]

[Maximum Marks—35

**Note** :— Attempt any **FIVE** questions. Selecting at least **ONE** question each from Sections A, B, C and D. **FIFTH** question may be attempted from any sections. All questions carry equal marks.

**SECTION—A**

1. Discuss analytically the phenomenon of interference of light. Hence obtain the conditions required for sustained interference. 7
2. What are Newton rings ? Explain the formation of dark and bright fringes. 7

**SECTION—B**

3. Explain how a zone plate forms the image of an object and show that it acts as a converging lens. 7
4. Explain Rayleigh criterion of resolution. What is limit of resolution and resolving power ? Derive an expression for resolving power of a telescope. 7

### SECTION—C

5. (a) What is polarisation of light ? Explain the phenomenon of polarisation on reflection. 5
- (b) The polarising angle for a certain medium is  $\frac{\pi}{4}$ . Find the refractive index of the medium. 2
6. What is a quarter wave plate ? How would you distinguish plane polarised and elliptically polarised light. 7

### SECTION—D

7. What is the difference between Stimulated emission and Spontaneous emission ? Explain how population inversion is responsible for laser action. 7
8. Give detailed information for construction, energy level scheme and mode of working of He-Ne laser. 7