Question bank on Wave optics
Semester_IV

1.

(i) Why is it necessary to use narrow source for Fresnel's biprism experiment?

(ii) What do you mean by positive crystal?

(iii) Write down the Rayleigh criterion for resolution?

2. (i) What do you mean by interference of light?

(ii) Show that dark and bright fringes produced in Young's double slit experiment are equally spaced.

(iii) Show that in two dimension the shape of the fringes is hyperbola.

(iv) Why are those fringes called non-localized?

3. (i) What do you mean by Fraunhoffer diffraction?

(ii) Obtain the intensity expression for Fraunhoffer diffraction of double slit experiment. Deduce the condition for minima and maxima.

(iii)What is missing order?

4. Give Fresnel's theory of rotation of the plane of polarization by an optically active substance.

5. i. Obtain the positions of minima and maxima for single slit diffraction pattern.

ii. Obtain the thickness of quarter wave plate. How will you produce circularly polarised light from two plane polarised light?

6. i. What do you mean by interference of light?

ii. Show that dark and bright fringes produced in Young's double slit experiment are equally spaced.

iii. Show that in two dimension the shape of the fringes is hyperbola.

iv.Why are those fringes called non-localized?

7. i. What do you mean by Fraunhoffer diffraction?

ii. Obtain the intensity expression for Fraunhoffer diffraction of double slit experiment. Deduce the condition for minima and maxima.

iii. What is missing order?

8. (i) Distinguish between polarised and unpolarised light.

(ii)State and explain Brewster's law.

9. (i) What do you understand by double refraction?

(ii) What are ordinary and extraordinary rays?

(iii)Define optic axis and principal section of a crystal.

10. Describe the construction and action of a nicol prism. Explain how a Nicol prism is used to produce and analyse plane polarised light.

11. How would you distinguish between elliptically polarised light and a mixture of plane polarised and unpolarised light?

12. State and explain Malus law. How will you prove the law experimentally?