

Date: 12-Jul-2026**Time: 60min****Wave Optics****Marks: 20****SECTION A**

Q.1 **Select and write the correct answer for the following multiple choice type of questions:** **(3)**

i Huygens' Wave Theory of light could not explain _____.

(A) reflection

(B) refraction

(C) interference

(D) Photoelectric effect

ii A parallel beam of light travelling in water is incident obliquely on a glass surface. After refraction its width _____.

(A) decreases

(B) increases

(C) remains the same

(D) becomes zero

iii According to Newton's corpuscular theory of light, light of different colours corresponds to corpuscles of

(A) different phases

(B) different states

(C) different stabilities

(D) different sizes

Q.2 **Answer the following questions:** **(3)**

i State Huygens' principle.

ii Explain what is meant by polarization.

iii What is meant by coherent sources?

SECTION B

Attempt any TWO questions of the following: **(4)**

Q.3 The optical path of a ray of light of a given wavelength travelling a distance of 3 cm in flint glass having refractive index 1.6 is same as that on travelling a distance x cm through a medium having refractive index 1.25. Determine the value of x.

Q.4 **(A)** What is wavefront?

(B) What is the shape of the wavefront at a point far away from the source of light?

Q.5 State drawbacks of Newton's corpuscular theory.

Q.6 Two coherent sources whose intensity ratio is 25:1 produce interference fringes. Calculate the ratio of amplitudes of light waves coming from them.

SECTION C

Attempt any TWO questions of the following: **(6)**

Q.7 Describe what is Rayleigh's criterion for resolution.

- Q.8** What is Brewster's law? Derive the formula for Brewster angle.
- Q.9** (A) A transparent thin plate of polaroid is placed on another similar plate such that angle between their axes is 60° . What is the ratio of intensities of emergent and unpolarized incident light?
- (B) The optical path difference between two identical light waves arriving at a point is 60.5 wavelengths. Is the point bright or dark? Explain.

SECTION D

Attempt any ONE question of the following: (4)

- Q.10** (A) Plane wavefront of light of wavelength $5500 \text{ \AA}$ is incident on two slits in a screen perpendicular to the direction of light rays. If the total separation of 10 bright fringes on a screen 2 m away is 2 cm, find the distance between the slits.
- (B) In an oil immersion objective microscope, oil of R.I 1.412 is used. The wavelength of illuminating light is $4850 \text{ \AA}$ and the semi-vertical angle is 45° . Find the limit of resolution and the R.P.
- Q.11** Derive conditions for occurrence of dark and bright fringes on screen in Young's double slit interference experiment. Define fringe width and derive formula for it.