CBSE NCERT Based Chapter wise Questions (2025-2026)
Class-XII
Subject: Physics
Chapter Name : Wave Optics (Chap: 7)
Total : 6 Marks (expected) [MCQ-1, Short questions-2, Long questions-3]
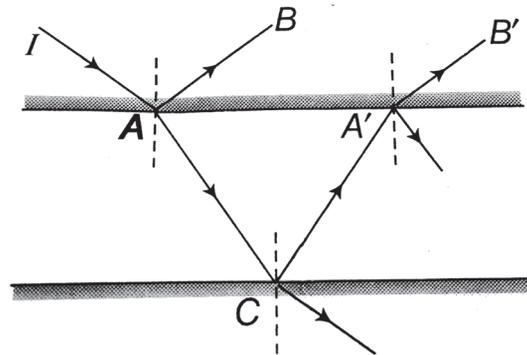
Level - 1

MCQ Type : [1 marks]

1. A ray light of intensity I is incident on a parallel glass-slab at a point A as shown in figure. It undergoes partial reflection and refraction. At each reflection 25% of incident energy is reflected. The rays AB and A´B´ undergo interference. The ratio I_{max} / I_{min} is

- (A) 4 : 1
- (B) 8 : 1
- (C) 7 : 1
- (D) 49 : 1

2. In young's double slit experiment the slits are 0.02 cm apart and the screen is 1.5 m away. It is observed that the distance between the central bright fringe and fourth dark fringe is 1.8 cm, find wavelength of light used.

- (A) 6.86×10^{-7} m
- (B) 6.86×10^{-8} m
- (C) 6.86×10^{-18} m
- (D) 7.86×10^{-18} m

3. In the adjacent diagram, CP represents a wavefront and AO & BP, the corresponding two rays. Find the condition on θ so that constructive interference at P between the ray BP and reflected ray OP
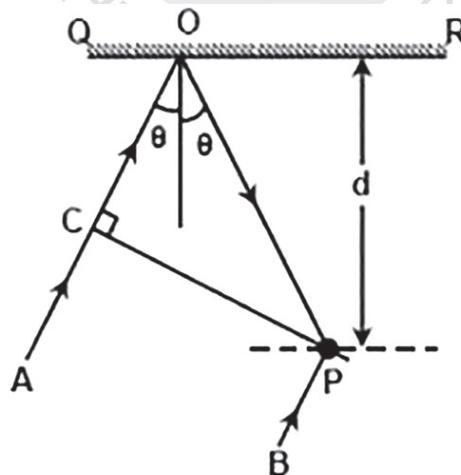
- (A) $\cos \theta = 3\lambda/2d$
- (B) $\cos \theta = \lambda/4d$
- (C) $\sec \theta - \cos \theta = \lambda/d$
- (D) $\sec \theta - \cos \theta = 4\lambda/d$

4. Calculate the limit of resolution of microscope with cone angle of light falling on the objective equal to 60°. (Given $\lambda = 5000$ A, μ for air = 1)

- (A) 5×10^{-7} m
- (B) $0.8 \, \mu$m
- (C) 7×10^{-7} m
- (D) None of these

5. In the Young's double slit experiment, if the phase difference between the two waves interfering at a point is ϕ, the intensity at that point can be expressed by the expression

Ⓐ $I = \sqrt{A^2 + B^2\cos^2\varphi}$ Ⓑ $I = \dfrac{A}{B}\cos\varphi$ Ⓒ $I = A + B\cos\dfrac{\varphi}{2}$ Ⓓ $I = A + B\cos\varphi$

Where A and B depend the amplitudes of the two waves.

Short Answer Questions :   [2 marks]

1. Light wave can be polarised while sound waves can not. Why?

2. What is the polarising angle of a medium of refractive index $\sqrt{3}$.

3. Why is interference pattern not detected when to the two coherent sources are far apart?

4. Why does the intensity of the secondary maximum become less as compared to the central maximum?

5. When a wave undergoes reflection at a denser medium, what appears to its phase?

6. Why are coherent sources necessary to produce a sustained interference pattern.

Long Answer Questions :   [3 marks]

1. In youngs double slit experiment the intensity at centre of screen is I. If one of the slits is closed find the intensity at centre.

2. In YDSE, the fringe width is found to be β. If the entire apparatus is immersed in a liquid of refractive index μ, find the new fringe width.

3. If two souces have a randomly varying phase difference $\phi(t)$, find the resultant intensity.

4. In YDSE, two slits are separated by 2 mm and the screen is placed one meter away. When a light of wave length 500 nm is used. Find the fringe separation?

A N S W E R

MCQs

1. Ⓓ	2. Ⓐ	3. Ⓑ	4. Ⓐ	5. Ⓓ

Long Answer Questions

1. $\dfrac{I}{4}$	2. $\dfrac{\beta}{\mu}$	3. $2I_0$	4. 0.25mm