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JEE

Prayas JEE (2025)

Physics

Wave Optics

DPP: 3

Q1 If two sources are coherent, then the phase difference (ϕ) between the waves produced by them at any point

(A) Will change with time and we will have stable positions of maxima and minima.

(B) Will not change with time and we have unstable positions of maxima and minima.

(C) Will not change with time and we will have stable positions of maxima and minima.

(D) Will change with time and we will have unstable positions of maxima and minima

Q2 Two coherent sources must have the same

(A) Amplitude

(B) Phase difference

(C) Frequency

(D) Both (B) and (C)

Q3 For the sustained interference of light, the necessary condition is that the two sources should

(A) Have constant phase difference

(B) Be narrow

(C) Be close to each other

(D) Of same amplitude

Q4 Ratio of intensities of two light waves is given by $4:1$. The ratio of the amplitudes of the waves is

(A) $2:1$ (B) $1:2$

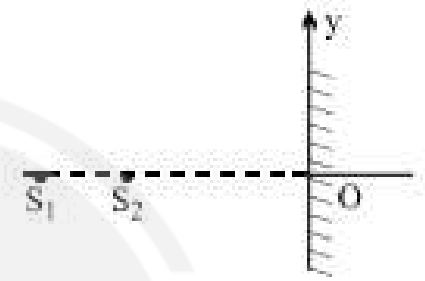
(C) $16:1$ (D) $1:4$

Q5 If an interference pattern have maximum and minimum intensities in $36:1$ ratio then what will be the ratio of amplitudes

(A) $1:1$ (B) $7:4$

(C) $4:7$ (D) $7:5$

Q6 Two point monochromatic and coherent sources of light of wavelength λ are placed on the dotted line in front of an large screen. The source emit waves in phase with each other. The distance between S_1 and S_2 is d while their distance from the screen is much larger. Then, Which of the following is/are correct statement(s)?



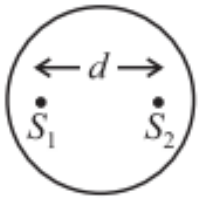
(A) If $d = 7\lambda/2$, O will be a minima

(B) If $d = 4.3\lambda$, there will be a total of 8 minima on y axis.

(C) If $d = \lambda$, O will be a maxima.

(D) If $d = \lambda$, there will be only one maxima on the screen.

Q7 Two coherent sources separated by distance d are radiating in phase having wavelength λ. A detector moves in a big circle around the two sources in the plane of the two sources. The angular position of $n = 4$ interference maxima is given as



(A) $\sin^{-1}\frac{n\lambda}{d}$

(B) $\cos^{-1}\frac{4\lambda}{d}$

(C) $\tan^{-1}\frac{d}{4\lambda}$

(D) $\cos^{-1}\frac{\lambda}{4d}$

Q8

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Two beams of light having intensities I and $4I$ interfere to produce a fringe pattern on a screen. The phase difference between the beams is $\frac{\pi}{2}$ at point A and π at point B. Then the difference between the resultant intensities at A and B is

(A) $2I$ (B) $4I$

(C) $5I$ (D) $7I$

Q9 In YDSE how many maxima can be obtained on the screen if wavelength of light used is $200\ \mathrm{nm}$ and $d = 700\ \mathrm{nm}$

(A) 12 (B) 7

(C) 18 (D) None of these

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Answer Key

Q1	(C)
Q2	(D)
Q3	(A)
Q4	(A)
Q5	(D)
Q6	(A, B, C, D)
Q7	(B)
Q8	(B)
Q9	(B)

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