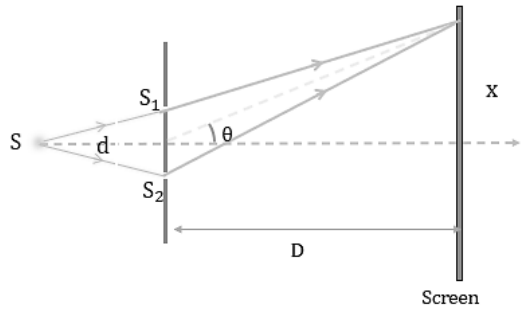
Q.1 Two identical coherent waves each of intensity I_0 are producing interference patterns. What is the value of resultant intensity at a point of destructive interference?

(A) $4I_0$ **(B)** I_0 **(C)** 0 **(D)** $2I_0$

Q.2 In Young's double slit experiment, the intensity on the screen at a point where path differences is λ is K. What will be the intensity at the point where path difference is $\frac{\lambda}{4}$?

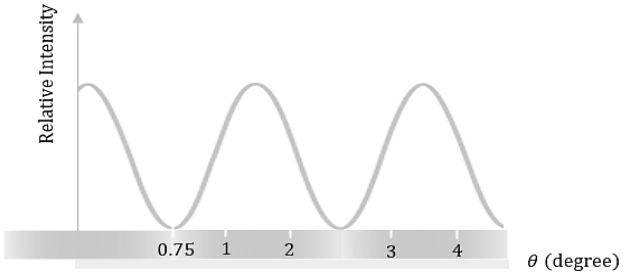
(A) $\frac{K}{4}$ **(B)** $\frac{K}{2}$ **(C)** k **(D)** Zero

Q.3 In YDSE, having slits of equal width, let β be the fringe width and I_o be the maximum intensity. At a distance x from the central bright fringe, the intensity will be



(A) $I_0 \cos\frac{x}{\beta}$ **(B)** $I_0 \cos^2\frac{2\pi x}{\beta}$ **(C)** $I_0 \cos^2\frac{\pi x}{\beta}$ **(D)** $\frac{I_0}{4}\cos^2\frac{\pi x}{\beta}$

Q.4 Light of wavelength 520 nm passing through a double slit, produces an interference pattern of relative intensity versus deflection angle θ as shown in the figure. Find the separation d between the slits.

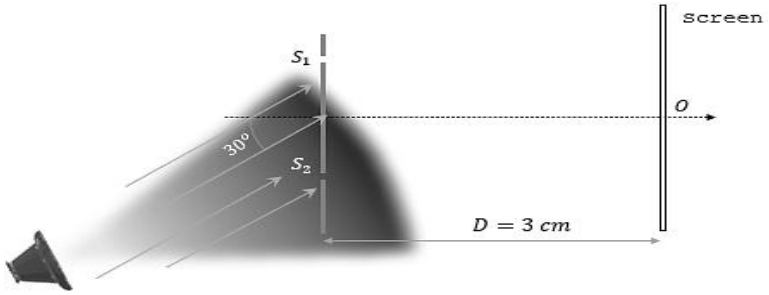


(A) 1.98×10^{-4} m **(B)** 1.98×10^{-5} m **(C)** 1.98×10^{-5} m **(D)** 1.98×10^{-7} m

Q.5 In a Young's double slit experiment, the path difference at a certain point on the screen between two interfering waves is $1/8^{th}$ of wavelength. The ratio of the intensity at this point to that at the center of a bright fringe is close to

(A) 0.80 **(B)** 0.85 **(C)** 0.74 **(D)** 0.94

Q.6 A parallel beam of light of wavelength 500 nm is incident at an angle 30° with the normal to the slit plane in a Young's double slit experiment. The intensity due to each slit is I_0. Point O is equidistant from S_1 and S_2. The distance between slits is 1 mm. Choose the correct statement.



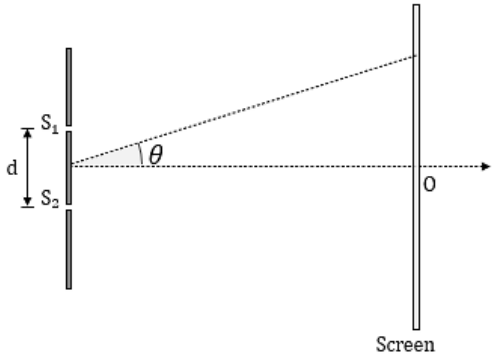
(A) The intensity at O is zero. **(B)** The intensity at O is $4I_0$.

(C) The intensity at O is $2I_0$. **(D)** The intensity at O is $I_0/2$.

Q.7 A double slit of separation 0.1 mm is illuminated by white light. A colored interference pattern is formed on a screen 100 cm away. If a pinhole is located in this screen at a distance of 2 *mm* from the central fringe, the wavelengths in the visible spectrum (4000 Å to 7000 Å) which will be absent in the light transmitted through the pinhole is

(A) 4000 Å **(B)** 5000 Å **(C)** 6000 Å **(D)** 7000 Å

Q.8 A Waves from coherent sources, having intensity I_0 each, meet at point P. What is the resultant intensity of two waves at P, if the path difference between the waves is $\frac{\lambda}{3}$?

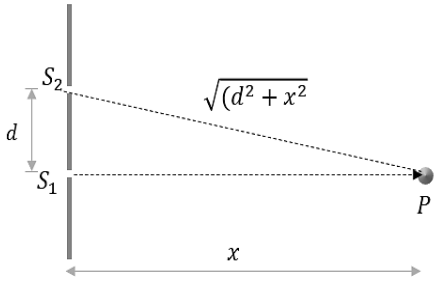


(A) I_0 **(B)** $2I_0$ **(C)** $\frac{\sqrt{3}\,I_0}{2}$ **(D)** $\frac{2I_0}{\sqrt{3}}$

Q.9 Two waves of equal frequencies, have their amplitudes in the ratio of 4: 5. They are superimposed on each other. Calculate the ratio of maximum and minimum intensity of the resultant wave.

(A) 3:1 **(B)** 9: 1 **(C)** 27: 1 **(D)** 81: 1

Q.10 Consider two coherent monochromatic sources S_1 and S_2, each of wavelength λ and separated by a distance d. The ratio of the intensity of S_1 and S_2 is 4. A detector moves on the line perpendicular to S_1S_2 as shown in the figure. If the resultant intensity at point P is equal to $\frac{9}{4}$ times intensity of S_1, then the distance of P from S_1 is, (Given:d $>$ 0 and n is a positive integer)



(A) $\frac{d^2-n^2\lambda^2}{2n\lambda}$ **(B)** $\frac{d^2+n^2\lambda^2}{2n\lambda}$ **(C)** $\frac{n\lambda d}{\sqrt{d^2-n^2\lambda^2}}$ **(D)** $\frac{2n\lambda d}{\sqrt{d^2-n^2\lambda^2}}$

ANSWER KEY

Q.	1	2	3	4	5	6	7	8	9	10
Sol.	(C)	(B)	(C)	(B)	(B)	(B)	(A)	(A)	(D)	(A)