

## DPP – 1 (Wave Optics)

Video Solution on Website:-

<https://physicsaholics.com/home/courseDetails/96>

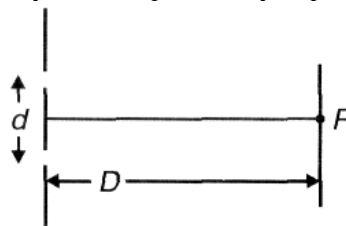
Video Solution on YouTube:-

<https://youtu.be/VQeQi262Ril>

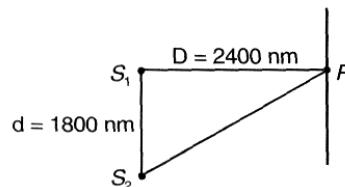
Written Solution on Website:-

<https://physicsaholics.com/note/notesDetails/47>

- Q 1. In a Young's double slit experiment, two slits of equal width allow to pass light of equal intensity. If we cover one slit by dark strip intensity at point P



- (a) Must decrease and becomes  $1/2$  times  
 (b) Must increase  
 (c) Must decrease and becomes  $1/4$  times  
 (d) Must increase and becomes 4 times
- Q 2. In a YDSE apparatus,  $d=2$  mm,  $\lambda = 600$  nm,  $D = 1$  m. The slits produce same intensity on the screen. Find the position of point where intensity is  $3/4$  times of maximum intensity  
 (a) 0.01 mm      (b)  $13 \times 10^{-4}$  mm      (c) 0.05 mm      (d)  $1.5 \times 10^{-4}$  mm
- Q 3. White light is used for interference, for how many waves, we get maximum at point P?



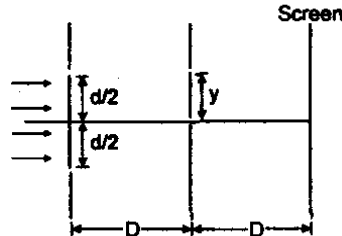
- (a) 1      (b) 2      (c) 3      (d) 7
- Q 4. Light waves travel in vacuum along the y-axis, which of the following may represent the wave fronts?  
 (a)  $y = c$       (b)  $x + y = c$       (c)  $z = c$       (d)  $x = c$
- Q 5. In YDSE, how many maxims can be obtained on a screen including central maxima) in both sides of the central fringe if  $\lambda = 3000 \text{ \AA}$ ,  $d = 5000 \text{ \AA}$   
 (a) 2      (b) 5      (c) 3      (d) 1
- Q 6. In a YDSE biochromatic light of wavelengths 400 nm and 560 nm are used. The distance between the slits is 0.1 mm and the distance between the plane of the slits and the screen is 1 m. The minimum distance between two successive regions of complete darkness is  
 (a) 4 mm      (b) 5.6 mm      (c) 14 mm      (d) 28 mm



Q 7. The maximum intensity in Young's double slit experiment is  $I_0$ . Distance between the slits is  $d = 5\lambda$ , where  $\lambda$  is the wavelength of monochromatic light used in the experiment. What will be the intensity of light in front of one of the slits on a screen at a distance  $D = 10d$ ?

- (a)  $\frac{I_0}{2}$                       (b)  $\frac{3}{4}I_0$                       (c)  $I_0$                       (d)  $\frac{I_0}{4}$

Q 8. In the Young's double slit experiment apparatus shown in figure, the ratio of maximum to minimum intensity on the screen is 9. The wavelength of light used is  $\lambda$ , then the value of  $y$  is:



- (a)  $\frac{\lambda D}{d}$                       (b)  $\frac{\lambda D}{2d}$                       (c)  $\frac{\lambda D}{3d}$                       (d)  $\frac{\lambda D}{4d}$

Q 9. In a Young's double slit experiment, 12 fringes are observed to be formed in a certain segment of the screen when light of wavelength 600 nm is used. If the wavelength of light is changed to 400 nm and distance between plane of slits and screen is increased to two times, number of fringes observed in the same segment of the screen is given by:

- (a) 12                      (b) 9                      (c) 24                      (d) 30

Q 10. Yellow light emitted by sodium lamp in Young's double slit experiment is replaced by monochromatic blue light of the same intensity –

- (a) Fringe width will decrease  
 (b) Fringe width will increase  
 (c) Fringe width will remain unchanged  
 (d) Fringes will become less intense

Q 11. A double slit is illuminated by two wavelengths 450 nm and 600 nm. What is the lowest order at which the maxima of one wavelength coincides with the minima of the other wavelength ?

- (a) 1                      (b) 2                      (c) 3                      (d) 4

Q 12. If the first minima in a Young's slit experiment occurs directly in front of one of the slits. (distance between slit & screen  $D = 12$  cm and distance between slits  $d = 5$  cm) then the wavelength of the radiation used is:

- (a) 2 cm only                      (b) 4 cm only                      (c) 2cm,  $\frac{2}{3}$ cm,  $\frac{2}{5}$  cm                      (d) 4 cm,  $\frac{4}{3}$ cm,  $\frac{4}{5}$  cm

Q 13. In Y.D.S.E. if screen is extended to infinity and distance between slits is  $d = 20.3\lambda$ , where  $\lambda$  is wavelength of light used, Find total no of minima on screen?

- (a) 41                      (b) 42                      (c) 40                      (d) 44



## Answer Key

Q.1 c	Q.2 c	Q.3 a	Q.4 a	Q.5 c
Q.6 d	Q.7 a	Q.8 c	Q.9 b	Q.10 a
Q.11 d	Q.12 a	Q.13 c		

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