# PHYSICS

## BOOKS - NIKITA PHYSICS (HINGLISH)

## INTERFERENCE AND DIFFRACTION

### Multple Choice Questions

**1.** The process of vector addtion of individual displacements of light waves at a point when two or more than two waves arrive at two points is

A. principleof superposition of waves

B. polarisation of light

C. Huygen's construction

D. diffraction of ligth

**Answer: A**

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**2.** Let $a_1$ and $a_2$ be that amplitude of two light waves and $a_1$ and $a_2$ be their initial phases. The resultant amplitude due to supersition of two light waves is

A. $R = \sqrt{a_1^2 + a_2^2 + 2a_1a_2}$

B. $R = a_1 - a_2$

C. $R = \sqrt{a_1^2 + a_2^2 + 2a_1a_2\cos(\alpha - (1))\alpha_2)}$

D. $R = \sqrt{a_1^2 + a_2^2 - 2a_1 - a_2}$

**Answer: C**

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**3.** the penomenon of nonuniform distribution of energy due to the superposition of two light waves is

A. reflection of light

B. interference of light

C. diffraction of light

D. polarisation of light

**Answer: B**

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**4.** The phenomenon of producing oalternate points of maximum and minimum intensity due to the superposition of two light waves is

A. refraction of light

B. reflection of light

C. interference of light

D. diffraction of light

**Answer: C**

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**5.** If two light waves of same amplitude 'a' trvaelling thrugh a mdedium arrive t a point in same pahses then the

resultant amplitude r at that points is

A. $R = 4a$

B. $R = a$

C. $R = 3a$

D. $R = 2a$

**Answer: D**

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**6.** If two light waves each of amplitude a travelling a travelling through a medium arrive at a point in opposite phase then the resultant amplitude R at that points is

A. $R = 0$

B. $R = a$

C. $R = 2a$

D. $R = 4a$

**Answer: A**

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**7.** Interference of light is the physcal effect which is produces due to the

A. superpositon of light waves

B. reflection of waves

C. refractino of light waves

D. Huugen's principle

**Answer: A**

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**8.** Intensity of light at point is directly proportional to

A. amplitude of wave

B. square of amplitude of wave

C. cube of amplitude of wave

D. wavelength of wave

**Answer: B**

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**9.** One important similarity between sound and light is that both

A. can pass throug even in the absence of any medium

B. are transverse waves

C. travel at the same speed in air

D. can show interference effect

**Answer: D**

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**10.** Interfeence phenomenon can take place

A. in all waves

B. in tranverse waves only

C. in longitudinal waves

D. in standing waves only

**Answer: A**

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**11.** For different independent waves are represented by

a) $Y_1 = a_1 \sin \omega_1 t$ , b) $Y_2 = a_2 \sin \omega_2 t$

c) $Y_3 = a_3 \sin \omega_3 t$ , d) $Y_4 = a_4 \sin\left(\omega_4 t + \frac{\pi}{3}\right)$

The sustained interference is possible due to

A. (i) and (iii)

B. $(i)$ and $(iv)$

C. $(iii)$ and $(iv)$

D. not possible at all

**Answer: D**

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**12.** Which of the following is conserved, when light waves inteffere ?

A. Frequency

B. Amplitude

C. Force

D. Momentum

**Answer: A**

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**13.** When viewed in white light, soap bubbles show colours because of

A. interference

B. scattering

C. diffracton

D. disperison

**Answer: A**

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**14.** Interference was observed in interference chamber when air was present, now the chamber is evacuated and if the same light is used, a careful observer will see

A. no interference

B. interference with brights bands

C. interference with dark bands

D. interference in which breadth of the fringer will be slighty increased

**Answer: D**

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**15.** When the interence of light take place, then the

A. mass is conserved

B. energy is conserved

C. intensity at all the points is same

D. intensify at all the points is zero

**Answer: B**

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**16.** When interference of light place, the intensity of light

A. is maximum at same points and at rest of the points is minimum

B. increases at some point and remains the same at rest of the points

C. decreases at same and remains same ate rest of the points

D. does not change at all

**Answer: A**

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**17.** For interrference of light, sources must have,

A. same freqency

B. frequencies very does to each other widely different freqeuncie

C. widely different frequencies

D. none of these

**Answer: A**

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**18.** Colours thin films are due to

A. dispersion of light

B. interference of light

C. absorption of light

D. scattering of light

**Answer: B**

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**19.** The transverse nature of light is shown by

A. interference of light

B. refraction of light

C. polarisation of light

D. dispersion of light

**Answer: C**

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**20.** In the interference pattern, energy is

A. created at the position of maxima

B. destroyged at the position of minima

C. conserved but is redistributed

D. not conserved

**Answer: C**

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**21.** Wave nature of light follows because

A. light travels in a straight line

B. light exhibites the phenomena of reflection and refraction

C. light exhibits the phenomenon of interference

D. light cause the phenomenon of photelectric effect

**Answer: C**

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**22.** Light energy has

A. particle like properties

B. wave like properties

C. sometimes particle like properties and sometimes wave like properties

D. neither wave nor particle nature

**Answer: C**

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**23.** The physical effect produced due to the superpostion of two light waves which are arriving in the same phase is

A. interference of light

B. constructive interference of light

C. destructive interference of light

D. diffreaction of light

**Answer: B**

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**24.** For constructive interference to take place between two monochromatic light waves of wavelength $\lambda$ , the path difference should be

A. $(2n-1)\frac{\lambda}{4}$

B. $(2n-1)\frac{\lambda}{2}$

C. $n\lambda$

D. $(2n+1)\frac{\lambda}{2}$

**Answer: C**

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**25.** For constructive interference to take place between two monochromatic light waves of wavelength $\lambda$ , the path difference should be

A. $(2n-1)\pi$

B. $(2n-1)\pi$

C. $2\pi n$

D. $\pi n$

**Answer: C**

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**26.** If the path difference between the two light waves at a point is equal to intergral multiple of wavelength of then points appears as

A. bright

B. dark

C. may be bright or dark

D. none of these

**Answer: A**

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**27.** For constructive interference to take place between two light waves, the pahse difference should be

A. even integral multiple of $\pi$

B. integral multiple of $2\pi$

C. odd multiple of $\pi$

D. both 'a' and 'b'

**Answer: D**

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**28.** For producing destructive interference the lengths of the two waves must be

A. equal

B. nearly equal

C. widely difference

D. none of these

**Answer: A**

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**29.** The physical effect produced due to the superpostion of two light waves which are arriving in the same phase is

A. interference of light

B. constructive interference of light

C. destructive interference of light

D. polarisation of light

**Answer: C**

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**30.** For constructive interference to take place between two monochromatic light waves of wavelength $\lambda$ , the path difference should be

A. $2\pi n$

B. $(2n-1)\pi$

C. $(2n+1)\pi$

D. both 'a' and 'b'

**Answer: D**

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**31.** For constructive interference to take place between two monochromatic light waves of wavelength $\lambda$ , the path difference should be

A. $n\lambda$

B. $(2n-1)\frac{\lambda}{4}$

C. $(2n-1)\frac{\lambda}{2}$

D. $(2n-1)\lambda$

**Answer: C**

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**32.** For destructive interference to take place between two light, waves the path difference should be

A. intergral multiple of wave length

B. odd multiple of half of wave length

C. zero

D. none of these

**Answer: B**

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**33.** If the phase difference between the two light waves interfering at point of the medium is equal to odd multiple of $\pi$ then tat point appears are

A. bright

B. dark

C. may be bright or dark

D. none of these

**Answer: B**

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**34.** The path difference between the two waves

$$y_1 = a_1 \sin\left(\omega t - \frac{2\pi x}{\lambda}\right) \text{ and } y(2) = a_2 \cos\left(\omega t - \frac{2\pi x}{\lambda} + \phi\right)$$

is

A. $\frac{\lambda}{2\pi}\phi$

B. $\frac{\lambda}{2\pi}\left(\phi + \frac{\pi}{2}\right)$

C. $\frac{2\pi}{\lambda}\left(\phi - \frac{\pi}{2}\right)$

D. $\frac{2\pi}{\lambda}\phi$

**Answer: B**

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**35.** Two waves at a point are represented by $E_1 = E_0 \sin \omega t$ and $E_2 = E_0 \sin(\omega + \phi)$. There will eb destructive interference at this point is

A. $\phi = 0$

B. $\phi = \frac{\pi}{2}$

C. $\phi = \pi$

D. $\phi = \pi / 4$

**Answer: C**

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**36.** For the points of brighness due to two indentical light waves interfering at a point, which of the following is true ?

A. crest or through of one wave concidies with the crest or through of another wave

B. path difference $= n\lambda$

C. path oflight is maximum

D. all of these

**Answer: D**

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**37.** The reagion or locus of all dark points produced due to interference of two identical light waves is

A. bright band of bright frings

B. dark bond or dark fring

C. band width

D. spectrum

**Answer: B**

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**38.** The locus of all bright points produced due to the superpostion of two indentical light waves is

A. bright frings

B. dark fringe

C. band width

D. spectrum

**Answer: A**

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**39.** A point p is situated $90.50cm$ and $90.58$ cm away from two coherent sources. The nature of illumination of the point p of the wavelength of light is 400Å is,

A. bright

B. dark

C. neither bright nor bark

D. noen of these

**Answer: A**

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**40.** The optical path difference between the two indentical waves arriving at a point is $75.5\lambda$ . Is the point bright or dark ?

A. Bright

B. Dark

C. Neither bright nor bark

D. None of these

**Answer: B**

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**41.** The path difference between the two indentical waves arrivings at a point is $100.5\lambda$ . If the path difference is $44\mu m$ , then wavelength of light will be

A. $4375Å$

B. $4000Å$

C. $4738Å$

D. $4873Å$

**Answer: A**

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**42.** The distances of a point on the screen from two slits in biprism experiment is $1.8 \times 10^{-5}$ m and $1.23 \times 10^{-5}$ m if wavelength of light used is 6000 Å then fringe formed at that point is

A. $8^{th}$ dark

B. $9^{th}$ dark

C. $10^{th}$ dark

D. $11^{th}$ dark

**Answer: C**

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**43.** In the experiment of interference of light, the optical paths at a point differ by $73.5$ times the wavelenth of blue light of $4400\text{Å}$ . The nature of the illumination at the same of point using red light of wavelength $6000\text{Å}$ will be

A. bright

B. dark

C. neither bright nor bark

D. none of these

**Answer: C**

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**44.** Let $I_1$ and $I_2$ be the intensity of two light waves of amplitudes $a_1$ and $a_2$ respectively . The resultant ampltiudes I at a point due to the superposition of two light waves is

A. $I = I_1^2 + I_2^1$

B. $I = \dfrac{(I_1 + I_2)}{(I_1 - I_2)}$

C. $I = I_1 I^2 + I_2^2 + 2\sqrt{I_1 I_2 \cos(\alpha_1 - \alpha_2)}$

D. $I = I_2 + I_2 + \sqrt{I_1 I_2} 2\cos(a_1 - a_2)$

**Answer: D**

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**45.** If the phase difference between the two light waves arriving at a point is (2n-1) $\pi$ radians. The condition for the minimumintensity of light at that point will be

A. $I_{\min} = (a_1 - a_2)^2$

B. $I_{\min} = a_1 - a_2$

C. $I_{\min} = (a_1 + a_2)^2$

D. $I_{\min} = a_1^2 - a_2^2$

**Answer: A**

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**46.** The phase difference between the two light waves arriving point is $2n\pi$radians. The condition for maximum

intensity of light at that point is

A. $I_{\max} = a_1 + a_2$

B. $I_{\max} = (a_1 + a_2)^2$

C. $I_{\max} = \frac{a_1}{a_2}$

D. $I_{\max} = \frac{a_1 + a_2}{a_1 - a_2}$

**Answer: B**

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**47.** Two sources of light having intensities $I_1$ and $4I_1$ emit the light waves. The phase difference between the light waves interfering at a point is $90^\circ$ . The intenity 'I' of light at that point, is

A. $I = 2I_1$

B. $I = 3I_1$

C. $I = 4I_1$

D. $I = 5I_1$

**Answer: D**

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**48.** The ratio of maximum intensity to minimum intensity due to interference of two light waves of amplitudes $a_1$ and $a_2$ is

A. $\frac{I_{\max}}{I_{\min}} = \frac{(a_1 + a_2)^2}{(a_1 - a_2)^2}$

B. $\frac{I_{\max}}{I_{\min}} = \frac{a_1 + a_2}{a_1 - a_2}$

C. $\frac{I_{\max}}{I_{\min}} = \frac{a_1^2 + a_2^2}{a_1^2 - a_2^2}$

D. none of these

**Answer: A**

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**49.** Consider interference between waves form two sources of intensities $I \& 4I$.Find intensities at point where the phase difference is $\pi$

A. $I = I_2$

B. $I = 2I_2$

C. $I = 3I_2$

D. $I = 0$

**Answer: A**

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**50.** In Young's double slit experiment, the intensity of light at a point on the screen where the path difference is $\lambda = l$. The intensity of light at a point where the path difference becomes $\lambda / 3$ is

A. $\frac{I}{4}$

B. $\frac{I}{2}$

C. $\frac{I}{3}$

D. I

**Answer: A**

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**51.** Ratio waves originating from sources $S_1$ and $S_2$ having zero phase difference and common wavelength $\lambda$ will show completely destructive interference at a point $P$ is $S_1P - S_2P$ is

A. $5\lambda$

B. $2\lambda$

C. $3\frac{\lambda}{4}$

D. $\frac{11\lambda}{2}$

**Answer: D**

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**52.** A coherent light is incident on two paralle slits $S_1$ and $S_2$. At a point $P_1$ the frings will be dark if the phase difference between the rays coming from $S_1$ and $S_2$ is

A. $n\pi$ radians

B. $(n+0.5)\pi$ radians

C. $(2n+0.5)\pi$ radians

D. $(2n+1)\pi$ radians

**Answer: D**

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**53.** Longitudinal waves do not exhibit

A. refraction

B. reflection

C. diffraction

D. polarisation

**Answer: D**

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**54.** Two sources of light of intensities I and 4I emit light waves which interfere at a point. Intensity will be ..... At points where the phase difference, is

A. zero $\pi$

B. $5I, \frac{\pi}{2}$

C. $I, \frac{\pi}{2}$

D. $3I, \frac{\pi}{2}$

**Answer: B**

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**55.** In experimental set up of interference the twol interfering sources $S_1$ and $S_2$ have an initial phase difference corresponding to a path difference of $\lambda/4$. The phase difference due to path difference between the twoll interfering waves at a point of constructive and destructive interference respectively is

A. $(2n-1)\frac{\pi}{2}, (2n+1)\pi$

B. $(2n-1)\pi, (2n+1)\frac{\pi}{2}$

C. $(2n-1)\pi, (2n+1/2)\pi$

D. $(2n+1/2)\pi, (2n-1/2)\pi$

**Answer: D**

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**56.** Two coherent monochromatic light beams of intensities I and 4I are superposed. The maximum and minimum possible intensities in the resulting beam are

A. 4 Iand I

B. 5 I and 3I

C. 9 I and I

D. 9 I and 3 I

**Answer: C**

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**57.** Interference fringes are obtained due to the interference of wave from two coherent sources of light with amplitudes $a_1$ and $a_2(a_1 = 2a_2)$. The ratio of the maximum and minimum intensities of light in the interference pattern is

A. $2:1$

B. $4:9$

C. $9:1$

D. $9:4$

**Answer: C**

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**58.** The interference patter in which the positions of maximum and minimum intensity of light remain fixed is

A. constructive interference

B. destructive interference

C. sustained interference

D. noen of these

**Answer: C**

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**59.** To obtain a sustained iterference pattern, we requie two sourece which emit radiation of

A. the same frquency

B. nearly the same frequency

C. the same frequency and have a defined phase relationship

D. different wavelenghths

**Answer: C**

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**60.** Two sources of waves are called coherent if

A. both have the same amplitude

B. both produce waves of the same wavelegths

C. both produce waves of the same wavelengths having a cosnstant phase difference

D. btoh produce waves having the same velocity

**Answer: C**

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**61.** The contrast in the fringes in an interference pattern depends on

A. fringe width

B. wavelelength

C. intensity ratio of the sourece

D. distance between the slits

**Answer: C**

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**62.** A monochromatic visible light, consiSt of

A. a single ray of light

B. light of a single wavelength

C. light consistaing of many wavelength with a single colour

D. light of a single wavelengths with all the colours of the spectrum of white light

**Answer: B**

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**63.** If the intensities of the two interfering beam in Young's double-slit experiment are $I_1$ and $I_2$, then the constrast between the maximum and minimum intensities are good when

A. $I_1$ is much greater than $I_2$

B. $I_1$ is much smaller than $I_2$

C. $I_1 = I_2$

D. either $I_1 = 0$ or $I_2 = 0$

**Answer: C**

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**64.** Two coherent sources must have the same

A. amplitude

B. phase

C. intensity

D. phase differene at all times

**Answer: D**

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**65.** For steady interference, two two sources of light must be

A. coherent

B. monochoromatic

C. equally bright

D. all of these

**Answer: D**

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**66.** A source of light is said to be monochromatic if it will emit light waves of

A. same wavelengths

B. differerent wavelengths

C. decreasing wavelenghts

D. increasing wavelngths

**Answer: A**

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**67.** Which of the following sources of light is monochromatic source ?

A. Sodium vapour lamp

B. Laser

C. Sun light

D. both 'a' and 'b'

**Answer: D**

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**68.** Two independent sources of light will not produce steady interference pattern because

A. they are cohernet

B. they are not coherent

C. they may be equally bright

D. none of these

**Answer: B**

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**69.** The devices which produces highly coherent sourcei is

A. Fresnel's biprism

B. Youngs' experiments

C. laser

D. sodium vapourn lamp

**Answer: C**

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**70.** In order to avoid overlapping of interference frings and their obliteration (destruction) the slit width must be

A. greater than fringe width

B. greater than distance between two slits

C. equal to distance between two slits

D. just less than fringe width

**Answer: D**

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**71.** Two sources of light are said to be equally bright if they will emit waves of same

A. velocity

B. wavelengths

C. amplitude

D. phase

**Answer: C**

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**72.** For the sustained interference of light, the necessary condition is that the two sources should

A. be narrow

B. be very close to each other

C. emit light waves continuously

D. all of these

**Answer: D**

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**73.** For good contrast between and minima in inteference pattern two sources of light should be

A. coherent

B. monochromatic

C. narrow

D. equally bright

**Answer: D**

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**74.** Two avoid the overlapping of maximum and minima in interference pattern two sources of light should be

A. narrow

B. very close to each other

C. both 'a' and 'b'

D. neither 'a' nor 'b'

**Answer: C**

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**75.** Interference of light was first of all experimentally observed by

A. Newton

B. Huygen

C. Younge

D. Fresnel

**Answer: C**

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**76.** Young's experiment proves that light consist of

A. particles

B. waves

C. sometimes waves and sometimes particles

D. photones

**Answer: B**

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**77.** How is the interfecence pattern affected whne the Young's experiment is performed in still water ?

A. Fewer fringes are visible

B. Fringes are broader

C. Fringes are narrower

D. Fringes are nto observed

**Answer: C**

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**78.** Young's experiment one slit is covered with blue and other is covered with yellow filter. The interference pattern wil look ?

A. Blue

B. Yellow

C. Green

D. Interference pattern is not seen

**Answer: D**

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**79.** In Young's experiments the two sources are independent indentical bulbs of same power. What happees to the interference pattern ?

A. Intensity of bright fringes is doubled

B. Intensity of bright fringes becoms 4 times

C. Intensity is uniform and no fringes are oberved

D. Two sets o fringes overlaps giving darkness

**Answer: C**

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**80.** If a torch is used in place of monochromatic light in Young's experiment what will happen?

A. Fringe will occure as from monochromatic source

B. Fringe will appear for a moment and then it will disappear

C. No fringe will appear

D. Only bright fringe

**Answer: C**

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**81.** Young's experiment is performed in air and then performed in water, the fringe width:

A. will remains same

B. will decreases

C. will increases

D. data are insulfficient

**Answer: B**

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**82.** The fringe width in a Young's double slite experiment can be increased by decreasing

A. separation of the slits

B. frequency of the source of light

C. distance between the slit and the screen

D. wavelength of the source of light

**Answer: A**

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**83.** The fringe pattern observed on Young's double-slit experiment is

A. a diffreaction pattern

B. an interference pattern

C. a combination of diffraction and interference pattern

D. neither a diffraction nor a interference pattern

**Answer: C**

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**84.** In Young's doble-slit experiment, if the monochromatic source of light is replaced by white light, then one sees

A. no interference fringe pattern

B. coloured fringesq

C. black and white fringes

D. white central fringe sorrounded by a new coloured fringes on either side

**Answer: D**

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**85.** In Young's experiment with one source and two slits, one of the slits is covered with black paper. Then

A. the fringes will be darker

B. fringes will be narrower

C. the fringes will be broader

D. no fringes will be obtained and the screen will have uniform illumination

**Answer: D**

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**86.** In Young's interference expriment with one source and two slits, one slit is covered with a cellophane of sheet which absorbs half the intensity. Then

A. no fringes are obtained

B. bright fringes will be brighter and dark fringes will be darker

C. all fringes will be darker

D. bright fringes will less bright and darker fringes will be less dark

**Answer: D**

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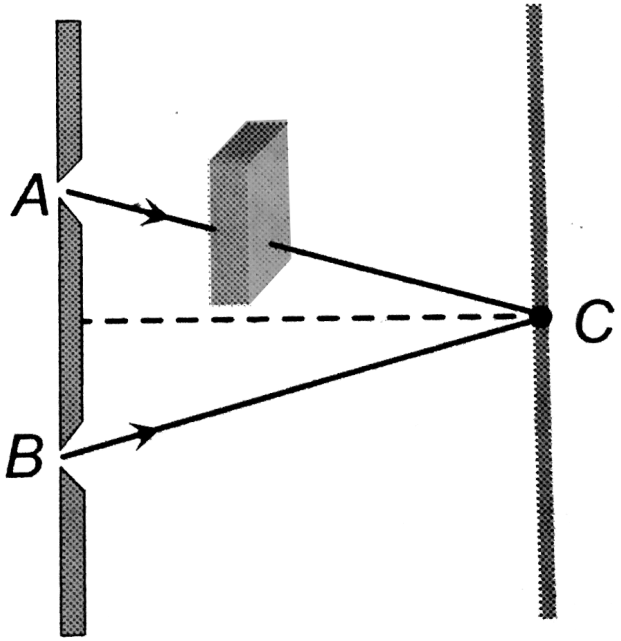
**87.** In Young's experiment, monochromatic light is used to illuminate the two slits A and B. Interference fringes are observed on a screen placed in front of the slits. Now if a thin glass plate is placed normally in the path of the beam coming from the slit




A. fringes will disappear

B. the fringe width will dicreases

C. the fringe width will increases

D. there will be no changed in the fringe width

**Answer: D**

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**88.** In double slits experiment, for light of which colour the fringe width will be minimum

A. violet

B. Red

C. Green

D. Yellow

**Answer: A**

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**89.** Thomas Young demonstrated interference of light in

A. 1801

B. 1901

C. 1897

D. 1857

**Answer: A**

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**90.** In Youg's double slite arrangment the central fringe is

A. always dark

B. always bright

C. may be bright or dark

D. neither bright nor dark

**Answer: B**

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**91.** In Young's double slite experiment, the separation between the two slite is halved. The fringe width

A. remains same

B. becomes double

C. reduced of half

D. becomes $(1/4)^{th}$ of its earilier value

**Answer: B**

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**92.** The optical path difference between the two light waves arriving at a point on the screen is

A. $\frac{xd}{D}$

B. $\frac{xD}{d}$

C. $\frac{d}{xD}$

D. $\frac{dD}{x}$

**Answer: A**

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**93.** The distance of $n^{th}$ bright fringe from the centre of the interference pattern is

A. $x_n = \frac{D}{d} n\lambda$

B. $x_n = \frac{D}{d}(2n-1)\frac{\lambda}{2}$

C. $x_n = Dn$

D. $x_n = \frac{n\lambda}{d}$

**Answer: A**

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**94.** The distance of $n^{th}$ minima from the centre of interference pattern is

A. $x_n = \frac{D}{d} n\lambda$

B. $x_n = \frac{D}{d}(2n-1)\frac{\lambda}{2}$

C. $x_n = Dd$

D. $(2n-1)\frac{\lambda}{2}$

**Answer: B**

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**95.** The optical path difference at a point on the screen which is equidistant from two sources is

A. zero

B. greater than zero

C. less than zero

D. none of these

**Answer: A**

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**96.** The distance between any two successive bright bands is

A. mean free path

B. wavelength

C. amplitude

D. fringe width

**Answer: D**

Watch Video Solution

**97.** The distance between any two successive dark bands is given by

A. $\beta = \frac{D}{d}\lambda$

B. $\beta = \frac{\lambda}{d}$

C. $\beta = \frac{d\lambda}{D}$

D. $\beta = D, d$

**Answer: A**

Watch Video Solution

**98.** In interference of light, bandwidthis

A. directly proportional to wavelength

B. directly proportional to distance between slite and screen

C. inversely proportinal distance between the slits

D. all of these

**Answer: D**

Watch Video Solution

**99.** The bandwidth of fringes is independent of

A. wavelength

B. distance between two source

C. distance between slit and screen

D. order of the fringes

**Answer: D**

Watch Video Solution

**100.** In interference of light, $\beta$ is fringe width. The distance of $n^{th}$ maxima from the centre of interferene pattern is

A. $x_n n.\ \beta$

B. $x_n = (2n-1)\frac{\beta}{2}$

C. $x_n = \frac{\beta}{n}$

D. $x_n = n^2 . \beta$

**Answer: A**

Watch Video Solution

**101.** In interference of light $\beta$ is band width. The distance of $n^{th}$ minima from the centre of the interference pattern is

A. $x_n n . \beta$

B. $x_n = (2n - 1)\frac{\beta}{2}$

C. $x_n = \frac{\beta}{n}$

D. $x_n = (2n - 1)^2 . \beta$

**Answer: B**

Watch Video Solution

**102.** Two waves of equal amplitude and frequency interfere each other. The ratio of intensity when the two waves arrive in phase to that when they arrive $90^\circ$ out of phase is

A. $2:1$

B. $1:1$

C. $\sqrt{2}:1$

D. $4:1$

**Answer: A**

Watch Video Solution

**103.** In the Young's experiment, the distance between slit and screen is doubled and the distance between the two slits is reduced to half. The fringe widht is

A. doubled

B. becomes four times

C. halved

D. remaines the same

**Answer: B**

Watch Video Solution

**104.** In interference with two choherent beam of light, the frige widht is

A. proportional to the wavelength

B. inversely proportional to the wavelenght

C. proportional to the square of the wavelength

D. inversely proportionla to the square of the wavelenght

**Answer: A**

Watch Video Solution

**105.** In Young's experiments the separation of slits is made 2 times. The fringe width will become

A. half

B. 2 times

C. 4 times

D. $(1/4)^{th}$ times

**Answer: A**

Watch Video Solution

**106.** In Young's experiment the ratio between the intensities of bright and dark fringes is $9:1$ this means

A. the intensities at the screen due to the slits are 5 units each

B. the intensities at the screen due to the slits are 4 units and 2 units

C. the amplitude are in the ratio $1:3$

D. the amplitude ratio is $2:1$

**Answer: D**


**107.** If in Young's experiment the distance between the two slits is doubled and the distance of the screen and slite is halved the fringewidth

A. is doubled

B. becomes 4 times

C. remains the same

D. becomes one fourth

**Answer: D**

Watch Video Solution

**108.** In double slite experiment if the transparent material of refractive index $\mu$ s introduced in between second slit and screen, the fringe widht on the screen moves

A. vertically downwards slightly

B. vertically upwards slightly

C. horizontally towards left

D. horizontally towards right

**Answer: A**

Watch Video Solution

**109.** In Young's experiment the wavelenght of red light is $7.8 \times 10^{-5} cm$ and that of blue light is $5.2 \times 10^{-5}$ cm. The value of n for which $(n+1)^{th}$ blue bright band coincides with $n^{th}$ red band is

A. 4

B. 3

C. 2

D. 1

**Answer: C**

Watch Video Solution

**110.** In Young's double slit experiment, the distance between two sources is $0.1mm$. The distance of screen from the sources is $20cm$. Wavelength of light used is $5460\text{Å}$. Then angular position of the first dark fringe is

A. $0.08^\circ$

B. $0.16^\circ$

C. $0.20^\circ$

D. $0.32^\circ$

**Answer: B**

Watch Video Solution

**111.** In Young's double slit interference experiment, the slit separation is made 3 fold. The fringe width becomes

A. (1/3) times

B. 3 times

C. (1/9) times

D. 9 times

**Answer: A**

Watch Video Solution

**112.** Two coherent light sources $S_1$ and $S_2(\lambda = 6000\text{Å})$ are $1mm$ apart from each other. The screen is placed at a

distance of $25cm$ from the sources. The width of the fringes on the screen should be

A. $0.0015cm$

B. $0.025$ cm

C. $0.010$ cm

D. $0.030cm$

**Answer: A**

Watch Video Solution

**113.** Two slits at a distance of $1mm$ are illuminated by a light of wavelength $6.5 \times 10^{-7}m$. The interference fringes are observed on a screen placed at a distance of $1m$. The

distance between third dark fringe and fifth bright fringe will be

A. $0.65mm$

B. $1.265mm$

C. $3.25mm$

D. $4.88mm$

**Answer: B**

Watch Video Solution

**114.** The Young's double slit experiment is performed with blue and with green light of wavelengths $4360A$ and $5460A$

respectively. If $X$ is the distance of $4th$ maximum from the central one, then :

A. $X_{(\text{blue})} = X_{(\text{green})}$

B. $X_{(\text{blue})} > X_{(\text{green})}$

C. $X_{(\text{blue})} < X_{(\text{green})}$

D. $\frac{X_{(\text{blue})}}{X_{(\text{green})}} = \frac{5460}{4360}$

**Answer: C**

Watch Video Solution

**115.** In a double slite experiment, the distance between the slit is $0.05cm$ and screen is 2 m away from the slits. The

wavelength of light is $6 \times 10^{-5}$ cm. The distance between the two successive bright fringes is

A. $0.24cm$

B. $2.21cm$

C. $1.28cm$

D. $0.12cm$

**Answer: A**

Watch Video Solution

**116.** In Young's double slit experiment, if the slit widths are in the ratio $1:9$, then the ratio of the intensity at minima to that at maxima will be

A. 1

B. $1/9$

C. $1/4$

D. $1/3$

**Answer: C**

Watch Video Solution

**117.** Two waves having the intensities in the ratio of $9:1$ produce interference. The ratio of maximum to minimum intensity is equal to

A. $10:8$

B. $9:1$

C. $4:1$

D. $2:1$

**Answer: C**

Watch Video Solution

**118.** In a two slit experiment with monochromatic light fringes are obtained on a screen placed at some distance from the sits. If the screen is moved by m $5 \times 10^{-2} m$ towards the slits, the change in fringe width is m $3 \times 10^{-5} m$ . If separation between the slits is $10^{-3} m$ , the wavelength of light used is

A. $6000 Å$

B. $5000\text{Å}$

C. $3000\text{Å}$

D. $45000\text{Å}$

**Answer: A**

Watch Video Solution

**119.** In a Young's experiment, two coherent sources are placed $0.90mm$ apart and the fringes are observed one metre away. If is produces the second dark fringe at a distance of $1mm$ from the central fringe, the wavelength of monochromatic light used would be

A. $60 \times 10^{-4}$ cm

B. $10 \times 10^{-4} cm$

C. $10 \times 10^{-5} cm$

D. $6 \times 10^{-5} cm$

**Answer: D**

Watch Video Solution

**120.** In Young's doble slite experiment, the distance between the slit . The slite is illuminated by light of wavelenght $5000 Å$. The third maximum will be at

A. $1.67 cm$

B. $1.5 cm$

C. $0.5 cm$

D. $5.0cm$

**Answer: B**

Watch Video Solution

**121.** In an experiment similar to young's experiment,interference is observed using waves associated with electrons.The electrons are being produced in an electron gun.In order to increase the fringe width .

A. electron gun goltage is increased

B. electron gun voltage is decreased

C. the slite be moved away

D. the screen be moved closer to interfering slits.

**Answer: B**

Watch Video Solution

**122.** In a Young's double slit experiment, the fringe width is found to be $0.4mm$. If the whole apparatus is immersed in water of refractive index $4/3$ without disturbing the geometrical arrangement, the new fringe width will be

A. $0.30mm$

B. $0.40mm$

C. $0.53mm$

D. $0.20mm$

**Answer: A**

Watch Video Solution

**123.** White light is used to illuminate the two slits in a Young's double slit experiment. The separation between the slits is b and theh screen is at a distance $d(>>b)$ from the slits At a point on the screen directly in front of one of the slits, certain wavelengths are missing some of these missing wavelengths are

A. $\lambda = \frac{b^2}{d}$

B. $\lambda = \frac{b^2}{3d}$

C. $\lambda = \frac{2b^2}{d}$

D. both 'a' and 'b'

**Answer: D**

Watch Video Solution

**124.** In a biprims experiment, the slite is illuminated by red light of wavelenght 6400. A.U. and the crosswire in the eypeice is adjusted to be at the centre of the $3^{rd}$ bright band . By using blue light it is found that the $4^{th}$ bright band is at the centre of the croswiere, find teh wavelength of blue light.

A. 4800 A.U.

B. 4500 A.U.

C. 5800 A.U.

D. 4600 A.U.

**Answer: A**

View Text Solution

**125.** Interference fringes were produced in Young's double slit experiment using light of wavelength 5000 Ã.... When a film of material $2.5 \times 10^{-3} cm$ thick was placed over one of the slits, the fringe pattern shifted by a distance equal to 20 fringe widths. The refractive index of the material of the film is

A. $1.25$

B. $1.33$

C. $1.4$

D. $1.5$

**Answer: C**

Watch Video Solution

**126.** Interference pattern is obtained on a screen due to two identical sources of monochromatics light. The intensity of the central brigh fringe is I when one of the two sources is blocked, its intensity becomes $I_0$. The intensity in two situations are related as

A. $I = I_0$

B. $I = \sqrt{2}.\ I_0$

C. $I = 2I_0$

D. $I = 4I_0$

**Answer: D**

Watch Video Solution

**127.** In double slit experiment, the angular width of the fringes is $0.20^\circ$ for the sodium light $(\lambda = 5890\text{Å})$. In order to increase the angular width of the fringes by $10\,\%$, the necessary change in the wavelength is

A. increased of $589\text{Å}$

B. decreases of $589\text{Å}$

C. increases of $6479\text{Å}$

D. 0

**Answer: A**

Watch Video Solution

**128.** In Young's double-slit experiment using $\lambda = 6000\text{Å}$, distance between the screen and the source is 1m. If the fringe-width on the screen is 0.06 cm, the distance between the two coherent sources is

A. $0.01mm$

B. 1 cm

C. $0.1$ mm

D. 1 mm

**Answer: D**

Watch Video Solution

**129.** Two waves having amplitudes in the ratio $5:1$ produce interference. The ratio of the maximum to minimum intesnity is

A. $25:1$

B. $6:4$

C. $9:4$

D. $3:2$

**Answer: C**

Watch Video Solution

**130.** In Young's double-slit experiment , we get 60 fringes in the field of view if we use light of wavelength $4000\text{Å}$. The

number of fringes we will get in the same field of view if we use light of wavelength $6000\text{Å}$ is

A. 40

B. 90

C. 60

D. 50

**Answer: A**

Watch Video Solution

**131.** In the double-slit experiment, the distance of the second dark fringe from the central line are $3mm$. The distance of the fourth bright fringe from the central line is

A. 6 mm

B. 8 mm

C. 12mm

D. 16 mm

**Answer: B**

Watch Video Solution

**132.** In a Young's double-slit experiment, the intensity ratio of maxima and minima is infinite. The ratio of the amlitudes of two sources

A. is infinity

B. is unity

C. is two

D. can not be predicted

**Answer: B**

Watch Video Solution

**133.** In a certain double slit experimental arrangement interference fringes of width $1.0mm$ each are observed when light of wavelength $5000Å$ is used. Keeping the set up unaltered, if the source is replaced by another source of wavelength $6000Å$, the fringe width will be

A. $0.5mm$

B. 1 mm

C. $1.2mm$

D. $1.5mm$

**Answer: C**

Watch Video Solution

**134.** In Young's double slit experiment, the intensity on the screen at a point where path difference is $\lambda$ is K. What will be the intensity at the point where path difference is $\lambda/4$?

A. $\frac{K}{4}$

B. $\frac{K}{2}$

C. K

D. zero

**Answer: B**

Watch Video Solution

**135.** Lights of wavelengths $\lambda_1 = 4500\text{Å}, \lambda_2 = 6000\text{Å}$ are sent through a double slit arrangement simultaneously. Then

A. no interference pattern will be formed

B. the thrid bright fringe of $\lambda_1$ will coincide with the fourth bright fringe of $\lambda_2$

C. the thrid bright fringe of $\lambda_2$ will coincide with the fourth bright fringe of $\lambda_1$

D. the fringes of wavelenths $\lambda_1$ will bw wider than the fringes of wavelenghts $\lambda_2$

**Answer: C**

Watch Video Solution

**136.** Biprism is a device used to obtain

A. two cohoerne sources from a single source

B. monochromatic light from two sources

C. both 'a' and 'b'

D. none of these

**Answer: A**

Watch Video Solution

**137.** In Fresnel's biprims experiment, the two sources of light are

A. two virtual images of slite

B. two real imatges of slite

C. two independent of light

D. none of these

**Answer: A**

Watch Video Solution

**138.** In Fresnel's biprims experiment coherent sources are obtained from an incoherent source using division of

A. amplitude

B. wavefront

C. phasee

D. none of these

**Answer: B**

Watch Video Solution

**139.** A biprism arrangement in air is immeresed completeely in a liaquid. The fringe width

A. remains same

B. increases

C. decreases

D. none of these

**Answer: B**

Watch Video Solution

**140.** Biprism is a combination of two acute angled glass parism which has

A. actue angle of $30^\circ$

B. each acute angle of $1^\circ$

C. refracting angle of aout $178^\circ$

D. both 'a' and 'b'

**Answer: D**

Watch Video Solution

**141.** The distance between diminshed and magnified images of slits for two positions are $d_1$ and $d_2$ respectively of the slite is

A. $d = d_1 d_2$

B. $d = \frac{d_1}{d_2}$

C. $d = \sqrt{d_1 d_2}$

D. $d = \sqrt{\frac{d_1}{d_2}}$

**Answer: C**

View Text Solution

**142.** In biprism experiment, biprism of refractive index $\mu$ has refracting angle $\alpha$, the biprism is at a distance u from the slits. The distance between the two virtual images of the slits is

A. $d = 2u(\mu - 1)\alpha$

B. $d = (\mu - 1)\alpha$

C. $d = u(\mu - 1)\alpha$

D. $d = \sqrt{\mu\alpha}$

**Answer: A**

View Text Solution

**143.** The distancebetwen two virtual images of slits in biprism experiment is measured using converx lens which is

A. Focuault's method

B. Huygen, methods

C. Young's method

D. conjugateed foci method

**Answer: D**

Watch Video Solution

**144.** In a biprism experiement, by using light of wavelength $5000\text{Å}$, $5mm$ wide fringes are obtained on a screen $1.0m$ away from the coherent sources. The separation between the two coherent sources is

A. 1 mm

B. $0.1mm$

C. $0.05mm$

D. $0.01mm$

**Answer: B**

Watch Video Solution

**145.** For steady interference pattern in biprism experiment, which of the following is true ?

A. Distance between slit and biprims should be less.

B. The refracting edge of the biprims should be verticl and paralle to the slit.

C. The slite biprism and eyepiece should be at same height.

D. all of these

**Answer: D**

View Text Solution

**146.** In a Fresnel's biprims experiment fringes widht $0.05$ mm are observed on a screen at a distance of $1.5$ m from the source. When a convex lens is placed between the source and the screen, are $0.04$ mm and $0.1$ mm resepectively. The wavelenght of light used is s

A. $6.67nm$

B. $0.6667nm$

C. $667nm$

D. $667Å$

**Answer: B**

Watch Video Solution

**147.** The distance between the slit and the biprism and between the biprims and the screen 50 cm each. The angle of the biprism is $179^\circ$ and its refractive index is $1.5$. If the distance between successive bright fringes is $0.0135cm$, then the wavelenghts of lights is

A. $5893 \times 10^{-10}cm$

B. $5898 \times 10^{-8}cm$

C. $5898 \times 10^{-8}m$

D. $2946 \times 10^{-8}cm$

**Answer: B**

View Text Solution

**148.** In two separate set-ups of YDSE, using light of same wavelength, fringes of equal width are observed. If ratio of slit separation in the equal width are observed. If ratio of slit separation in the two is $2:3$, the ratio of the distance between source and screen in the two set-ups is

A. $2:3$

B. $3:2$

C. $4:9$

D. $9:4$

**Answer: A**

Watch Video Solution

**149.** In a biprism experiment, the wavelenght of monochromatic light is $6000\text{Å}$. The distance between two virtual images is 6 mm . The number of fringes formed per mm on a screen placed at a distance of 1 m is

A. 5

B. 10

C. 15

D. 20

**Answer: B**

Watch Video Solution

**150.** In bipism experiment, the distance of $20^{th}$ bright band from the centre of the interference pattern is 8 mm. The distance of the $30^{th}$ bright band is

A. 4 mm

B. 8 mm

C. 12 mm

D. 16 mm

**Answer: C**

Watch Video Solution

**151.** In a biprism experiment, fringe width is $0.4$ mm when the eypiece is at a distance of 1 mm from the slit. If eyepiece

is moved without changing any other arrangment then the change in fringe width is

A. $0.1mm$

B. $0.2mm$

C. $0.15mm$

D. $0.25mm$

**Answer: A**

View Text Solution

**152.** In a biprism experimentn the the band width is found to be increased by 25% of the initial. If the distance between

sliteand eyepeice is increased by 20 cm then the initial distance between slit and epepiece is

A. 80 cm

B. 90 cm

C. 70 cm

D. 60 cm

**Answer: A**

Watch Video Solution

**153.** In a biprism experimentn the distance between second and eight dark fringes on the same side of central bright fringe is 3 mm. The fringe width is

A. 1 mm

B. $0.5$ mm

C. $1.5mm$

D. 2 mm

**Answer: B**

Watch Video Solution

**154.** In a biprism experimentn the distance between the two virtual images of the slite in the magnified and diminished position are $2.4$ mm and $0.6$ resepectively. The distance the two virtual images of the slit is

A. 1 mm

B. $1.2mm$

C. $2.4mm$

D. $0.6mm$

**Answer: B**

View Text Solution

**155.** In a biprism experimentn the distancce virtua images of the slit is $2.5mm$ and the eypiece is a distance of 1 m from the slits. If the fringe width is $0.3$ mm then the frequency of sources of lights is

A. $4 \times 10^{14} Hz$

B. $2 \times 1^{15} Hz$

C. $4 \times 10^{12} Hz$

D. $2 \times 1^{12} Hz$

**Answer: A**

Watch Video Solution

**156.** In a biprism experimentn is performed yellow light of wavelength $5600\text{Å}$. The yellow light was then replaced by red light of wavelengts $6400\text{Å}$. Find the value of n for which $(n+1)^{th}$ yellow bright band consider with the $n^{th}$ red bright band for the same setting.

A. 4

B. 5

C. 6

D. 7

**Answer: D**

Watch Video Solution

**157.** In a biprism experimentn the distance between slite and epepiece is 1m. If the convex lens is interposed at a distance of 30 cm from the slit, then the size of the magnified image is $0.7$ mm. The distance between the two virtual images of the slits will be

A. $0.1mm$

B. $0.2mm$

C. $0.3mm$

D. $0.4mm$

**Answer: C**

Watch Video Solution

**158.** In a biprism experimentn the distance between the two virtual images of the slits is 7 mm and the distance between slit adnd eyepiece is 1 m. If the distance between two consecurtive bright band is $0.1$ then the wavelength of lights is

A. $7000Å$

B. $6500Å$

C. $6000\text{Å}$

D. $5000\text{Å}$

**Answer: A**

Watch Video Solution

**159.** Two sources of light $0.85$ mm apart are illuminated by a light of wavelenths, 6000Å . The phase difference between the two waves intefering on screen,.1.7 m away from the slite at a point 2.5 mm from the central bright band is nearly.

A. 13 radians

B. 12 radians

C. 14 radians

D. 11 radians

**Answer: A**

Watch Video Solution

**160.** The phenomenon of diffraction of light was discovered by-

A. Fresnel

B. Fraunhofer

C. Young

D. Grimaldi

**Answer: D**

Watch Video Solution

**161.** Which of the following undergoe maximum diffraction ?

A. $\alpha$- rays

B. $\gamma$- rays

C. Radio waves

D. Light waves

**Answer: C**

Watch Video Solution

**162.** Phenomenon of bending of waves withoug a changed in medium is called

A. reflection

B. rerfraction

C. interference

D. diffraction

**Answer: D**

Watch Video Solution

**163.** The penetration of light into the region of geometrical shadow is called

A. interference

B. diffraction

C. polarisation

D. dispersion

**Answer: B**

Watch Video Solution

**164.** For obtaining diffraction pattern, aperture of the slite should be of the order of

A. $\lambda$

B. $\lambda/2$

C. $\lambda/4$

D. $2\lambda$

**Answer: A**

Watch Video Solution

**165.** A small circular disce is placed in the path of monochromatic light. The centreof the geometrical shadow is always

A. bright

B. dark

C. coloured

D. partly bright and partly dark

**Answer: A**

Watch Video Solution

**166.** A very samml opaque is place in the path of monochormatic light. Its shadow has

A. bright point at the centre surrounded by alternate bright and dark rings

B. dark point at the centre surrounded by alternate bright and dark rings

C. uniform darkness

D. uniform illumination

**Answer: A**

Watch Video Solution

**167.** The ratio of intensities of consecutive maxima in the diffraction pattern due to a single slit is

A. $1:2:3$

B. $1:4:9$

C. $1:\frac{2}{\pi^2}$

D. $1:\frac{4}{9\pi^2}:\frac{4}{25\pi^2}$

**Answer: D**

Watch Video Solution

**168.** A zone plae acts similar to a

A. convex lens

B. prism

C. plane mirror

D. plane glass plate

**Answer: A**

Watch Video Solution

**169.** The phase difference between two waves from successive half period zone is

A. $\pi / 2$

B. $\pi / 4$

C. $\pi$

D. zero

**Answer: C**

Watch Video Solution

**170.** The diffraction effect can be observed in

A. only sound waves

B. only light waves

C. only ultrasoic waves

D. sound as wll as light waves

**Answer: D**

Watch Video Solution

**171.** The fringes produce in diffraction pattern are of

A. equal width

B. unequal width

C. all dark fringes of zero intensity

D. all bright fringes of equal intensity

**Answer: B**

Watch Video Solution

**172.** The tip of needle does not give a sharp image. This is due to

A. interference

B. diffraction

C. polarisation

D. refraction

**Answer: B**

Watch Video Solution

**173.** Angular width $(\beta)$ of central maximum of a diffraction pattern on a single slit does not depend upon

A. distance between slit and source

B. width of slit

C. wavelengths of ligth used

D. frequency of light used

**Answer: A**

Watch Video Solution

**174.** On increasing the slite widht, the width of central maximum

A. increases

B. remains constant

C. decreases

D. becomes zero

**Answer: C**

Watch Video Solution

**175.** The position of minima in the diffraction pattern due to a single slite are expressed by the formula

A. $a \sin \theta = n\lambda$

B. $a \sin \theta = (2n + 1)\frac{\lambda}{2}$

C. $a \sin \theta = \frac{n\lambda}{2}$

D. $a \sin \theta = (2n - 1) \times \frac{\lambda}{2}$

**Answer: A**

Watch Video Solution

**176.** The diffraction effect of light expresses that

A. light is transverse wave motion

B. light is wave motion

C. light is longitudinal wave motion

D. light has quantum nature

**Answer: B**

Watch Video Solution

**177.** The size of the obstacel in order to observe diffraction fo light must be

A. of any order

B. of the order of wavelengths

C. much larger than wavelengths

D. much smaller than wavelenth

**Answer: B**

Watch Video Solution

**178.** Fresnel's zones are known as half period zones because the path diffrerence between consecutive zones is

A. $\lambda/2$

B. $\lambda$

C. $\lambda/4$

D. $2\lambda$

**Answer: A**

Watch Video Solution

**179.** The amplitudes of two consecutive half period zone are of

A. any sign

B. opposite sign

C. same sign

D. zero magnitude

**Answer: B**

Watch Video Solution

**180.** The phase difference between the first and thrid half period zone is

A. $2\pi$

B. $\pi$

C. $\pi^2$

D. $3\pi$

**Answer: A**

Watch Video Solution

**181.** The central point of the diffraction pattern due to a circular disc is

A. always dark

B. always bright

C. blurred

D. not clear

**Answer: B**

Watch Video Solution

**182.** In the diffraction pattern due to single slit, in the direction of $\theta = 0$ we get

A. first secondary minimum

B. central maximum

C. first secondary maximum

D. second secondary maximum

**Answer: B**

Watch Video Solution

**183.** A plane wavefront in incident normally on a circular aperture and diffraction pattern is obtained on a screen on another side of aperture. On displacing the screen towards aperture, the number to half period zone ezposed through the aperture

A. increases

B. decreases

C. remains unchanged

D. becomes zero

**Answer: B**

View Text Solution

**184.** Which of the following waves are diffracted by an obstacle of zise 1 cm

A. Light waves

B. Sound waves

C. Ultrasonic waves

D. X-rays

**Answer: C**

View Text Solution

**185.** The centre of the diffraction pattern in Fraunhofer diffraction is always

A. balck

B. bright

C. sometimesdark sometimes bright

D. dark for short wave lenghts and brights long wave lengths

**Answer: B**

Watch Video Solution

**186.** The cause of hearing of sound, produced in one room, in a nearby room is

A. interference of sound waves

B. reflection of sounds waves

C. absorption of sound waves

D. diffraction of sound waves

**Answer: D**

Watch Video Solution

**187.** What type of diffraction takes place in case of Yong's double slite experiment ?

A. Fresnel type

B. Fraunhofer type

C. neither Fresel type nor Fraunhofer type

D. sometimes Fresnel type sometimes Fraunhofer types

**Answer: A**

Watch Video Solution

**188.** The condition for observing Fraunhofer diffraction from a single slit is that the light wavefront incident on the slit should be

A. shperical

B. cylinderical

C. plane

D. elliptical

**Answer: C**

Watch Video Solution

**189.** In number of coherent sources are infinity them phenomenon of interference can be treated as phenomenon of

A. interference

B. polarisation

C. refraction

D. diffraction

**Answer: D**

Watch Video Solution

**190.** Crystalline structure of solids can be studied by using the method of

A. diffraction

B. interference

C. polarisation

D. refraction

**Answer: A**

Watch Video Solution

**191.** Light and radio wavs both are electromagnetic in nature. Radiowaves undergo appericable diffraction around buildings, where as light waves do not. This is because

A. wavelength of radiowavesis very small as comparedto the size of the building

B. wavelengths of radio waves is in the region of 200 to 400 m

C. light waves are transverse where as radiowaves are longitudinal

D. light waves travel faster than radiowaves

**Answer: B**

Watch Video Solution

**192.** First diffraction minima due to of a single slit diffraction is at $\theta = 30^\circ$ for a light of wavelength $6000\text{Å}$.

The width of slits is

A. $1 \times 10^{-6} cm$

B. $1.2 \times 10^{-6} cm$

C. $2 \times 10^{-6} cm$

D. $2.4 \times 10^{-6} cm$

**Answer: B**

Watch Video Solution

**193.** Light d of wavelength $5000\text{Å}$ is incident normally on a slite. The first minimum of the distance of 5 mm from the central maximum on a screen placed at a distance of 2 m from the slit. The width of slit is

A. $0.1mm$

B. $0.2mm$

C. $0.3mm$

D. $0.4mm$

**Answer: B**

Watch Video Solution

**194.** Light of wavelength $5000 \times 10^{-10}m$ is incident normally pattern is observed to lie at distance of 5 mm from the central maximum on screen place at a distance of 3 from the slit. Then the width of the slits is

A. 3 cm

B. $0.3cm$

C. $0.03cm$

D. $0.01cm$

**Answer: C**

View Text Solution

**195.** A beam of light of wavelength 600 nm from a distant source falls on a single slit 1 mm wide and the resulting diffraction pattern is observed on a screen 2 m away. The distance between the first dark fringes on either side of the central bright fringe is

A. $1.2mm$

B. $2.4mm$

C. $3.6mm$

D. $2.4cm$

**Answer: B**

Watch Video Solution

**196.** In a single slit diffraction, the width of slit is $0.5cm$, focal lengths of lens is 40 cm and wavelength of light is 40 cm and wavelength of light is $4890Å$. Distance of rist dark fringe is

A. $2 \times 10^{-5}m$

B. $4 \times 10^{-5}m$

C. $6 \times 10^{-5} m$

D. $8 \times 10^{-5} m$

**Answer: B**

Watch Video Solution

**197.** In single slit diffraction a $= 0.14$ mm, D =2 and distance of second dark band from central maxima is $1.6cm$ the wavelenght of light is

A. $6500Å$

B. $7500Å$

C. $5600Å$

D. $8500Å$

**Answer: C**

Watch Video Solution

**198.** A parallel beam of monochromatic light of wavelength $5000\text{Å}$ is incident normally on a single narrow slit of width $0.001mm$. The light is focused by a convex lens on a screen placed on the focal plane. The first minimum will be formed for the angle of diffraction equal to

A. $0^\circ$

B. $15^\circ$

C. $30^\circ$

D. $60^\circ$

**Answer: C**

Watch Video Solution

**199.** Light of wavelength $6328\text{Å}$ is incident normally on slit having a width of $0.2mm$The width of the central maximum measured form minimum to minimum of diffraction pattens on a screen $9.0meter$away will be about-

A. $0.36^\circ$

B. $0.18^\circ$

C. $0.72^\circ$

D. $0.09^\circ$

**Answer: A**

Watch Video Solution

**200.** Both light and soucnd waves produced diffraction. It is more difficult to bserve the diffraction with light waves because

A. light wave do not equired medium

B. wavelength of light waves is far smaller

C. light waves are transverse

D. speed of light is far greater

**Answer: B**

Watch Video Solution

**201.** A diffraction is obtained by using a beam of red light. What will happen if the red light is replaced by the blue light?

A. no change

B. diffraction bands become narrower and crowed together

C. bands become broader and farther apart

D. bands disappear

**Answer: B**

Watch Video Solution

**202.** Plane microwaves are incident on a long slit having a width of 5.0 cm. Calculate the wavelength of the microwaves if the first diffraction minimum is formed at $\theta = 30^\circ$.

A. 5 cm

B. 5 mm

C. 25 cm

D. $2.5cm$

**Answer: D**

Watch Video Solution

**203.** The correct relation between the size of the obstacle and wavelength of light in order to observe thde diffraction

event is

A. $\frac{a}{\lambda} = 1$

B. $\frac{a}{\lambda} = 0$

C. $\frac{a}{\lambda} = \infty$

D. $\frac{a}{\lambda} = 150$

**Answer: A**

Watch Video Solution

**204.** The phenomenon of diffractin can be treated as interferene phenomenon if the number of coherent sources are

A. one

B. tw

C. zero

D. infinity

**Answer: B**

Watch Video Solution

**205.** Diffraction pattern is obtained using red light. What will happen if it is replaced by violet light?

A. bands will disappear

B. band will become narrow

C. bands will get spaced apary

D. bands willl remain unchanged

**Answer: B**

Watch Video Solution

**206.** The distance between the first and the sixth minima in the diffraction pattern of a single slit is 0.5 mm. The screen is 0.5 m away from the slit. If the wavelength of light used is 5000 Å. Then the slit width will be

A. $2.5mm$

B. $5mm$

C. $1.25mm$

D. $1mm$

**Answer: A**

Watch Video Solution

**207.** Consider Fraunhoffer diffraction pattern obtained with a single slit illuminated at normal incidence. At the angular position of the first diffraction minimum the phase difference (in radians) between the wavelets from the opposite edges of the slit is

A. $\pi / 4$

B. $\pi / 4$

C. $\pi$

D. $2\pi$

**Answer: D**

Watch Video Solution

**208.** Bright colour's exhibited by spider's web, exposed to sunlight are dut to

A. interference

B. resolution

C. diffraction

D. polarisation

**Answer: C**

Watch Video Solution

**209.** Two nerby sources are said to be just resolved if the central maximum of one concides with the first minimum of

the other. This condition is given by

A. Fresnel

B. Fraunhofer

C. Rayleigh

D. Huygen

**Answer: C**


**210.** When separation between the central maxima of the two objects is greater than the separation between central maximumu of first object and the first minima of the first object, then the objects are said to be

A. just resolved

B. well resolved

C. not resolved

D. none of these

**Answer: B**

Watch Video Solution

**211.** When separation between the central maxima of the two objects is equal to the sepration between central maximum of first object and the first minima of the first objectn, then the objects are said to be

A. just resolved

B. well resolved

C. not resolved

D. none of these

**Answer: A**

Watch Video Solution

**212.** When sepration between the central maxima of the two object is less than the separation between central maximum of first object and the first minima of the first object and the first minima of the first object, then the objects are said to be

A. just resolved

B. well resolved

C. not resolved

D. none of these

**Answer: C**

Watch Video Solution

**213.** Which colour should be used to increases the resolving power of a microscope

A. violet

B. red

C. yellow

D. green

**Answer: A**

Watch Video Solution

**214.** Resolving power of telescop can be increased by

A. larger focal length of eyepiece

B. small focal length of eyepiece

C. large aperture of the objective lens

D. small focal length of the objective lens

**Answer: C**

Watch Video Solution

**215.** The ability of an optical instrument to show the images of two adjacent point as separate is called

A. dispersive power

B. magnifying power

C. resolving power

D. none of these

**Answer: C**

Watch Video Solution

**216.** The limit of resolution of an optical instrument arises on account of

A. interference

B. diffration

C. polarisation

D. none of these

**Answer: B**

Watch Video Solution

**217.** In order to raise the resolving power of the electron mocroscope we should

A. retard the electron

B. increases the de-Broglie wavelenght of the electron

C. acceleerate the electron through low potential

D. acceleerate the electron through high potential

**Answer: D**

Watch Video Solution

**218.** Resolving power of a microscope is increased by

A. increasing refractive index between ovbject and objective

B. decreasing the wavelengths

C. increasing the wavelengths

D. both 'a' and 'b'

**Answer: D**

Watch Video Solution

**219.** The reciprocal of the smalles angular separation between two distance object, so that they appear just separated is

A. resolving power of convex lens

B. resolving power of bi-prism

C. resolving power of microscope

D. resolving power of telescope

**Answer: D**

Watch Video Solution

**220.** In the resolving power of microscope the quantity $\mu \sin \theta$( according to Abbe) is called

A. resolving power of microscope

B. refractive index of microscope

C. numerical aperture

D. limit of resolution

**Answer: C**

Watch Video Solution

**221.** Resolving power of telescope can be inceased by

A. inceasing diamtere of the objective of the telescope

B. decreasing the wavelengths of light

C. decreasing diameter of the objective of the telescope

D. both 'a' and 'b'

**Answer: D**

Watch Video Solution

**222.** Radio telescope is used to see

A. stars and to measure diameters

B. distance stars and planets

C. high frequency waves

D. sun and to measure its temeprature

**Answer: B**

Watch Video Solution

**223.** Resolving power of an optical instrument is associated with

A. diffraction

B. polarisation

C. scattering of light

D. interference

**Answer: A**

Watch Video Solution

**224.** The aperture of telescope is increases to

A. get high resolving power

B. get higher magnifying power

C. reduce chromatic aberration

D. reduce spherical aberration

**Answer: A**

Watch Video Solution

**225.** The resolving power of a telescope dependeson

A. focal length of eye lense

B. length of the objective lense

C. lengths of the relescope

D. diamter of the objective lens

**Answer: D**

Watch Video Solution

**226.** The correct relation between limit of resolution and resolving power is

A. limit of resolution $= \frac{1}{\text{resolving power}}$

B. limit of resolution $\propto$ resolving power

C. limit of resolution $\propto \frac{1}{\text{resolving power}}$

D. limit of resolution $\propto$ (1-resolving power)

**Answer: A**

Watch Video Solution

**227.** Two stars distance two light yers are just resolved by a telescope. The wavelenght of light used in is $0.25$m. If the wavelenght of light used in $5000Å$ then the minimum distance between the stars is

A. $1.22 \times 10^{11} m$

B. $22.44 \times 10^{11} m$

C. $3.66 \times 10^{11} m$

D. $4.88 \times 10^{11} m$

**Answer: D**

View Text Solution

**228.** The diameter of an eye lens is $2.5 \times 10^{-3}$ m and the refractive index of the eye fluid is $1.44$. The resolving power of the eye for light of wavelenght $5000\text{Å}$ will be

A. $1.07'$

B. $0.86'$

C. $1.71'$

D. $1.14'$

**Answer: C**

Watch Video Solution

**229.** A windwo fitted with a wire mesh and distant 200 m is being viewed with the help of telescope. The spacing between the wires of the mesh is 2 mm. The wavelengths of light used is 5000Å . The minimum diamtere telescop must be

A. $6.1cm$

B. $5.9cm$

C. $4.2cm$

D. $3.6cm$

**Answer: A**

Watch Video Solution

**230.** Two stars are situated at a distance of 8 light years from the earth. These are to be just resolved by a telescope of diameter 0.25 m. If the wavelength of light used is 5000 Å, then the distance between the stars must be

A. $3 \times 10^{10} m$

B. $3.35 \times 10^{11} m$

C. $1.35 \times 10^{11} m$

D. $4.32 \times 10^{10} m$

**Answer: C**

Watch Video Solution

**231.** The diameter of an objective of a telescope, which can just resolve two stars situated at angular displacement of $10^{-4}$ degee, should be $(\lambda = 5000\text{Å})$

A. 35 m

B. 35 cm

C. 5 m

D. none of these

**Answer: B**

Watch Video Solution

**232.** Two points sources distance $0.1$ m are viewed by a telescope. The objective is covered by ascreen having a hole

of 1 mm widht. If the wavelenghts of light used is 5000Å, the the maximum distance at which the two sources are seen just resolved, will be

A. $125.0$

B. $102m$

C. $131m$

D. $164m$

**Answer: D**

Watch Video Solution

**233.** The numerical aperture of an objective of a microscope is $0.5$ and the wavelenght of light used is $5000\text{Å}$. Its limit of

resoluton will be

A. $6.1 \times 10^{7} m$

B. $5 \times 10^{-7} m$

C. $6.1 \times 10^{-4} m$

D. $6.1 \times 10^{4} m$

**Answer: B**

Watch Video Solution

**234.** Eye is most senstive to light of wavelenght 5550Å. If the diamter of the pupil is about $2.4mm$, the angular limit of resolution of eye will be

A. $1^{\circ}$ ’

B. $1'$

C. $1''$

D. none of the above

**Answer: B**

Watch Video Solution

**235.** The interference differs from diffraction in that

A. it cannot be oberved with white light

B. unlike diffraction the interference fringes are of varying intensity

C. interference minima are perfectly dark and that of diffraction may not be dark

D. the diffraction fringes are of equal width but the interference fringes are of unequal width

**Answer: C**

Watch Video Solution

**236.** The main difference in diffraction and interference is that

A. in diffraction, the fringe width of different firnges are not equal whereas in interference the fringes widths are equal

B. it cannot be observed with white light

C. unlike diffraction the interference fringesare

D. nono of these

**Answer: A**

Watch Video Solution

**237.** The main difference in diffraction and inteference is

A. in diffraction, all the maxima are of decreasing intensity whereas in interference all the maxima are of equal intensity

B. in diffraction, all the maxima are of equal intensity whereas in interference all the maixa are of decreasing intensity

C. in diffraction, all the maxima are of decreasing intensity whereas in interference all the maxima are of decreasing intensity

D. in diffraction, all the maxima are of equal intensity whereas in interference all the maxima are of equal intensity

**Answer: A**

Watch Video Solution

**238.** The path differece between the two indentical waves arriving at a point is $85.5\lambda$. If path difference is $42.5\mu m$ then wavelenght of light used is

A. $5971\text{Å}$

B. $4971\text{Å}$

C. $3971\text{Å}$

D. $6971\text{Å}$

**Answer: B**

Watch Video Solution

**239.** In Young's experiment, the dustance between two slit is $08$ mm and the distance of the screen from the slits is $80cm$

if the fringe width is $0.6mm$ , thent eh wavelenghts of light usedis

A. 6000Å

B. 5000Å

C. 55000Å

D. 4500Å

**Answer: A**

Watch Video Solution

**240.** In Young's experiment, the pinholes are illuminated by a monochromatic light of wavelengths $5200\text{Å}$. A screen is palaced at 1m. From the sli. If the pinhole are $1.3$ mm apart,

then distancebetween the sevength bright band on one side and sixth dark band on the other side of the central bright band will be

A. $20 \times 10^{-4} m$

B. $50 \times 10^{-4} m$

C. $30 \times 10^{-4} m$

D. $60 \times 10^{-4} m$

**Answer: B**

Watch Video Solution

**241.** In Young's experiment, the distance between two slit is 0.8 mm and distance of screen from slit is $1.2$ m. If the

fringe width is $0.79$ mm, then the wave length of light will be

A. 4267 A.U

B. 3267 A.U

C. 5267 A.U.

D. 5537 A.U

**Answer: C**

Watch Video Solution

**242.** In a biprism experiment, the distacne between the slit and the eyepiece is 80 cm and theseparation between the two virtual images of the slit is $0.25$ mm. If the slit is

illuminated by a light of wavelenght $6000\text{Å}$A, then distance of second bright band from central bright band will be

A. $3.84$ mm

B. $1.84$ mm

C. $3.24mm$

D. $2.24mm$

**Answer: A**

Watch Video Solution

**243.** In a biprism expeirment , the distance between the slit and the biprism is 20 cm and the distance between the biprism and focal and plane of the epyepiece is 80 cm.

Whith the separation between two virtual images of the slit seperation between two virtual images of the slit is 0.4 cm, an interfence pattern is obtained with a light of wavelength $5500\text{Å}$ .The distance between the third and eighth bands on the same side of the central bright band is

A. $1.68mm$

B. $3.68mm$

C. $2.68mm$

D. $0.68$ mm

**Answer: D**

Watch Video Solution

**244.** In a biprism experiment, the distance of the eighth bright band from the centre of interference pattner is 4 mm. The distance of the twelfth bright band from the centre of the interference pattner is

A. 6 mm

B. 5 mm

C. 4 mm

D. 2 mm

**Answer: A**

Watch Video Solution

**245.** In a biprism experiment, the slit is illuminated by a light of wavelength 5000Å . The distane between the slit and wyepieceis 1,. If the distance between the two virtual soruces is $0.25$ cm, then distance between fifth band on one side and the sixth dark band on the other side of the central bright band will be

A. $1.1$ mm

B. $2.2mm$

C. $2.1mm$

D. $3.1$ mm

**Answer: C**

Watch Video Solution

**246.** The distance between two consecutive dark bands in a Young's experiment is $0.32$ mm when red light of wavelenght 6400Å is used. By how much will this change if yellow light of wavelength 5900Å is uded with the same setting.

A. $0.25m$

B. $0.025mm$

C. $1.025mm$

D. $1.25mm$

**Answer: B**

Watch Video Solution

**247.** In the Young's experiment, the distance between slit and screen is doubled and the distance between the two slits is reduced to half. The fringe widht is

A. $3\beta$

B. $2\beta$

C. $4\beta$

D. $6\beta$

**Answer: A**

Watch Video Solution

**248.** In a biprism experiment, the distance between the slit and the focal plane of the eyepiece is $1.2m$ and the

wavelenght of light used is 5000Å. When a convex lenz is interposed (between the biprism and eyepiece) the images of the slits in the two positios are 5 mm and $1.8$ mm part. the distance betwene the centre of the pattern and twelfth dark band is

A. $1.3 \times 10^{-3} m$

B. $2.2 \times 10^{-3} m$

C. $3.3 \times 10^{-3} m$

D. $2.3 \times 10^{-3} m$

**Answer: D**

View Text Solution

**249.** In a biprism experiment, the distance between the two virtual images of the slit is $1.2$ mm and the wavelenght of light used is 4000Å . If the distance of third bright band from central bright band is 1 mm, and the distance is and the distance between the brprism and focal palne of the eyepiece is $0.9$, then distannce between slit and biprism will be

A. $0.1m$

B. $1.1m$

C. $0.5m$

D. $0.15\text{mm}$

**Answer: A**

Watch Video Solution

**250.** In a biprism experiment, interfernce bands are obtined in the focal of the eyepiece which is at a distance of $1.2$ m from the slit. The distance between the two virtual images of the slits is 1 mm. If the slit is illuminated by light of wavelenght 4800Å. The change in band width when the eyepiece is moved towards other the slit by 50 cm without distrubing the other arrangement is

A. $1.24mm$

B. $2.24mm$

C. $0.24mm$

D. $1.1mm$

**Answer: C**

Watch Video Solution

**251.** In a biprism expeirment , light of wavelenght 5200Å is ued to get an interference pattern on a screen. The fringe width changes by $0.13$ mm when the screen is brought towards the biprism by 50 cm . The distance between the virtual images of the slit is

A. 2 mm

B. 1 mm

C. $0.5$ mm

D. 2 cm

**Answer: A**

Watch Video Solution

**252.** In a biprism expeirment the slit is illuminated with light of waveleght 6000Å. The distance between the slit and eye piece is $0.9$m. The virtual images of the slit s are formed 3 mm apart. The source is then replaced by another sources of light of wavelength 5400Å. The slit and biprims are not disturbed. The distance betwene the slit and eyepiece to get the same band width s before is 2 m

A. 2 mm

B. 1 m

C. $0.5m$

D. 1cm

**Answer: B**

Watch Video Solution

**253.** In a biprism expeirment the distance between the thrid and thirteenth dark fringes on the same side of central bright fringe is y when light of wavelenght 5400Å is used. On replacing the source by another of a differnet wavleneght, without distrubing the adjustment of the appartus it is found tht the distance between the fourth and thirteenth dark fringes on the same side of the central bright fringe is the same as y. The wavelenght of ligh used in the second case is

A. 3000Å

B. 4000Å

C. 5000Å

D. 6000Å

**Answer: D**

Watch Video Solution

**254.** In two similar interferce experiments, wavelengths of light used were in the ratio $4:5$, the sources ot screen distances were in the ratio $5:6$ and the sources separation in the ration $2:3$. The ratio of their band width is

A. $1:1$

B. $1:2$

C. $2:1$

D. $1:4$

**Answer: A**

Watch Video Solution

**255.** In a biprism expeirment the slit is illuminated with light of wavelength 4800Å. The distance between the slit and eyepiece is 80 cm. the sources is then replaced by another source with a light of wavelenght 5400Å. The slit and biprims are not disturbed. The distance between the slit and eyepiece so that band widht increases by 8% as compared toe arlier band with is

A. $1.77m$

B. $2.77m$

C. $0.77m$

D. $1.57m$

**Answer: C**

Watch Video Solution

**256.** In a biprism experiment, the wavelenght of red light used is 6850Å and that of violet light used is 4050Å. The value of n for which the $(n+2)^{th}$ bright band for violet light would correponded to the $n^{th}$ bright band for red light for the same setting is

A. 3

B. 2

C. $2.5$

D. 4

**Answer:**

Watch Video Solution

**257.** In a biprism expeirment to determine the wavelenght of light, the distance between slit and eyepiece is 1,. Wavelenght of light used is 5600Å. When a convex lens is kept at a distance of 30 cm from the slit, the distance of fourth the two images is 0.7 mm. The distance of fourth dark band from the central bright band is

A. 6.5 mm

B. $4.5mm$

C. $7.5mm$

D. $7.0mm$

**Answer: A**

Watch Video Solution

**258.** In Young's double slit experiment to obtain interference pattern, light used consist of two wavlenghts 5200Å and 6500Å. The distance between the two slits is 2 mm and distance between slit and screen si 1.2m least bright band due to wavelenght overlaps is

A. $0.6 \times 10^{-4}m$

B. $1.56 \times 10^{-4}m$

C. $25.6 \times 10^{-4} m$

D. $15.6 \times 10^{-4} m$

**Answer: D**

Watch Video Solution

**259.** In a biprism expeirment the interference pattern is obtained with two monochromatic sources of light. It is observed that $15^{th}$ brigh band of one source coincides with $13^{th}$ brigh band of other source with the same setting . The ratio of wavlenght of tow sources

A. $1.86$

B. $0.86$

C. $2.86$

D. $0.46$

**Answer: B**

Watch Video Solution

**260.** In a biprism expeirment the fringes are observed in the focal plane of eyepiece at a distance of 1 m from the slit. The distance between $10^{th}$ bright band from the central bright band is $0.22$ . When convex lenz is interposed between the biprism the slit the distance betwen the magified imaes of the siit is found to be `0.93 cm. The wavelenght of light is uded is

A. $5820Å$

B. $4820Å$

C. $6820Å$

D. $3820Å$

**Answer: A**

View Text Solution

**261.** In a biprism experiment, the distance between the first and eleventh fringes formed by light of wavlenght $\lambda$ is $1.8 \times 10^{-3} m$. If the ligh is replaced by one of wavelenght $\lambda/2$, then distance between the first and sixteenth bright fringe will be

A. $2.35mm$

B. $1.35mm$

C. $1.45mm$

D. $2.45$ mm

**Answer: B**

Watch Video Solution

**262.** A monochromatic light of $\lambda = 5000\text{Å}$ is inciden on two slits seperated by a distance of $5 \times 10^{-4}m$. if a thin glass of thickness $1.5 \times 10^{-6}$ m and refractive index $1.5$ placed between one of the slits and screen. The pahses difference introduced at the position of central maxima is

A. $3\pi$

B. $2\pi$

C. $2\pi/3$

D. $\pi/3$

**Answer: A**

Watch Video Solution

**263.** Two coherent sources of intensity ratio $\alpha$ interface . In interference pattern $\frac{I_{\max} - I_{\min}}{I_{\max} + I_{\min}} =$

A. $\frac{2\sqrt{\alpha}}{1+\alpha}$

B. $\frac{2\sqrt{\alpha}}{1-\alpha}$

C. $\frac{2+\alpha}{2\sqrt{\alpha}}$

D. $\frac{2-\alpha}{2\sqrt{\alpha}}$

**Answer: A**

Watch Video Solution

**264.** A central fringe of interference pattern produced by light of wavelength $6000\text{Å}$ is shifted to the position of 5th bright fringe by introducing thin film of $\mu = 1.5$. Calculate thickness of the film.

A. $6 \times 10^{-4} mm$

B. $6 \times 10^{-4} m$

C. $6 \times 10^{-4} m$

D. 3 cm

**Answer: C**

Watch Video Solution

**265.** The obtuse angle of Fresnel's biprism is $178^\circ$. A slit is illuminated by light to wavelenght 6000Å is at distance of 10 cm from the biprism. Find the fringe widht on a screen at a distance of 90 cm from the biprism . The refractive index of the material of the birism is $1.5$

A. $0.000344mm$

B. $0.0034mm$

C. $0.034mm$

D. $0.34mm$

**Answer: C**

View Text Solution

**266.** In young's double slit experiment the distance between two sources is $0.1/\pi mm$.the distance of the screen from the source is $25cm$.wavelength of light used is $5000\text{Å}$.Then the angular position of the first dark fringe is-

A. $0.9^\circ$

B. $0.15^\circ$

C. $0.3^\circ$

D. $0.45^\circ$

**Answer: D**

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**267.** In Young's double slit experiment using sodium light ( $\lambda = 5898\text{Å}$) 92 fringes are seen if given colour $(\lambda = 5461\text{Å})$ is used how many fringes will be seen

A. 99

B. 85

C. 69

D. 62

**Answer: A**

Watch Video Solution

**268.** Distance between screen and sources is decreasesd by 25 % . Then the percentage change in fringe widht is

A. $20\ \%$

B. $31\ \%$

C. $75\ \%$

D. $25\ \%$

**Answer: D**

Watch Video Solution

**269.** In a Young's double slit experiment, the source illuminating the slits is changed from blue to violet. The width of the fringes

A. increases

B. remaisn constant

C. decrease

D. none of these

**Answer: C**

Watch Video Solution

**270.** Teo increases fringe width by keeping distance between slit and screen constant, we require

A. d increases $\lambda$ constant

B. d increases $\lambda$ decreases

C. d decreases $\lambda$ increases

D. d decreases $\lambda$ increases

**Answer: D**

Watch Video Solution

**271.** A double slit experiment is performed with light of wavelength $500nm$. A thin film of thickness $2\mu m$ and refractive index $1.5$ is introduced in the path of the upper beam. The location of the central maximum will

A. remains unshifted

B. shift downward by nearly two fringes

C. shift upwards by nearly two fringes

D. shift downward by 10 fringes

**Answer: C**

Watch Video Solution

**272.** Polarization oflight takes place due to many process. Wchih of the following will not cause polarization ?

A. reflaction

B. double refraction

C. scattering

D. diffraction

**Answer: D**

Watch Video Solution

**273.** In an interference experiment, third bright fringe is obtained at a point on the screen with a light of 700 nm . What should be the wavelength of the light source in order to obtain 5th bright fringe at the same point

A. 630 mm

B. 500 mm

C. 420 mm

D. 750 mm

**Answer: C**

Watch Video Solution

**274.** The slit width, when a light of wavelenght 6500Å is incident on a slit, if first minima for red light is at $30^\circ$ is

A. $1 \times 10^{-6} cm$

B. $5.2 \times 10^{-6} cm$

C. $1.3 \times 10^{-6} cm$

D. $2.6 \times 10^{-6} cm$

**Answer: C**

Watch Video Solution

**275.** If two waves represented by $y_1 = 4\sin\omega t$ and $y_2 = 3\sin\left(\omega t + \frac{\pi}{3}\right)$ interfere at a point, the amplitude of the resulting wave will be about

A. 7

B. 6

C. 5

D. $3.5$

**Answer: C**

Watch Video Solution

**276.** In Young's experiment the ratio of intensity at the maxima and minima in the interference patner is $3:16$ . What is the ratio of the widths of the two slits

A. $\frac{4}{1}$

B. $\frac{2}{3}$

C. $\frac{5}{1}$

D. $\frac{1}{5}$

**Answer: C**

Watch Video Solution

**277.** In the Young's double slit experiment , a mica slip of thickness t and refractive index $\mu$ is introduced in the ray from first source $S_1$ . By how much distance fringes pattern will be displaced ? (d = distance between the slits and D is the distance between slits and screen)

A. $\frac{D}{d}(\mu - 1)$

B. $\frac{1}{(\mu - 1)D}$

C. $\frac{D}{d}(\mu-1)t$

D. $\frac{d}{D}(\mu-1)t$

**Answer: C**

Watch Video Solution

**278.** If an interference pattern have maximum and minimum intensities in $36:1$ ratio, then what will be the ratio of amplitudes?

A. $5:7$

B. $7:4$

C. $4:7$

D. $7:5$

**Answer: D**

Watch Video Solution

**279.** The biprism experiment is performed by using first the blue light of wavelength 4800 Å and then with red light. It is found that the fourth bright band of blue light coincides with the third bright band of red light. What is the wavelength of red light?

A. 4800Å

B. 6000Å

C. 6400Å

D. 5600Å

**Answer: C**

Watch Video Solution

**280.** In Young's double slit experiment the widht of one slit is double that of the other. The ratio of intensity of bright band to that of a dark band in the interference pattern prodcued by them, is $9:1$

A. $9:1$

B. $6:1$

C. $3:1$

D. $2:1$

**Answer: A**

View Text Solution

**281.** In Young's double-slit experiment the angular width of a fringe formed on a distant screen is $1^{\circ}$. The wavelength of light used is $6000\text{Å}$. What is the spacing between the slits?

A. $0.034mm$

B. $0.01mm$

C. $1mm$

D. $0.05mm$

**Answer: A**

Watch Video Solution

**282.** The path difference produced by two waves is 3.75 $\mu$m and the wavelength is 5000 Å. The point is

A. uncertain

B. dark

C. partially bright

D. bright

**Answer: B**

Watch Video Solution

**283.** In a Young's double slit experiment set up, slits are kept $0.4$ mm apart from each other screen is kept 2 m apart from slit. The fringe for a givne monochoromatic light is $0.8mm$.

If the whole set up is kept in medium of refractive index $1.6,$ the fringe width becomes

A. $0.4mm$

B. $0.8mm$

C. $0.5mm$

D. $0.25mm$

**Answer: C**

Watch Video Solution

**284.** In the Young's experiment, one of the slit is covered with a transparent sheet of thickness $3.6 \times 10^{-3}$ cm due to which position of central fringe shifts to a position

originally occupied by 30th bright fringe. The refractive index of the sheet, if $\lambda = 6000\text{Å}$ is

A. $1.5$

B. $1.2$

C. $1.3$

D. $1.7$

**Answer: A**

Watch Video Solution

**285.** If the ratio of amplitude of two waves is $4:3$, then the ratio of maximum and minimum intensity is

A. $16:9$

B. $9:16$

C. $1:49$

D. $49:1$

**Answer: D**

Watch Video Solution

**286.** If a torch is used in place of monochromatic light in Young's experiment what will happen?

A. no fringe will appear

B. only bright will appear

C. fringe will occurs as from monochromatic source

D. fringe will appear for a moment and then it will disappear

**Answer: A**

 Watch Video Solution

**287.** Fringes are produced with monochromatic light of wavelengths $4.45 \times 10^{-5}$ cm. A thin glass plate of R.I.5 in then normally placedin one of the paths of interfering waves and the central bright band of the fringe system is found to move into the position, previously occupied by the thrie bright band from the system. The thickness of glass plate will be

A. $32.7 \times 10^{-4} cm$

B. $26.7 \times 10^{-5} cm$

C. $16.7 \times 10^{-5} cm$

D. $12.5 \times 10^{-5} cm$

**Answer: B**

Watch Video Solution

**288.** In biprism experiment the fringe width is $0.30mm$. If slits are covered by glass plate of thickess $0.04$ mm and refractive index $\mu = 1.5$ then the fringe widht is

A. $0.02mm$

B. $0.1mm$

C. $0.30mm$

D. $0.2\text{mm}$

**Answer: C**

Watch Video Solution

**289.** A wavelength of light $5600\text{Å}$ produces 60 fringes. What will be the number of fringes produced at same distance if wavelength of light used is $4800\text{Å}$?

A. 51

B. 70

C. 60

D. 45

**Answer: B**

Watch Video Solution

**290.** Two sources of light P and Q have wavelengths 6000 Å and 5500 Å respectively. In a biprism experiment, first the source P is used, and then it is replaced by the source Q. it is found that the position of the $n^{th}$ bright band corresponding to P is occupied by $(n+1)^{th}$ bright band of Q. what is the value of n?

A. 5

B. 6

C. 10

D. 11

**Answer: D**

Watch Video Solution

**291.** Distance between screen and source is decreased by 25%. Then the percentage change in fringe width is

A. $20\ \%$

B. $31\ \%$

C. $75\ \%$

D. $25\ \%$

**Answer: D**

Watch Video Solution

**292.** If two waves are not coherent, then it obtained

A. steady intereference

B. no interference

C. diffused interference

D. diminished interference

**Answer: C**

View Text Solution

**293.** To increse fringe width, by keeping distance between slit and screen constant, we need to ensure that

A. d increases $\lambda$ constant

B. d increases $\lambda$ decreases

C. d decreases $\lambda$ decreases

D. d decreases $\lambda$ increases

**Answer: D**

Watch Video Solution

**294.** Then nth bright band of red light of wavelength $6750\text{Å}$ is coincide with $(n+1)^{th}$ bright band of green light of wavelength $5400\text{Å}$. Find the value of $n$.

A. 5

B. 4

C. 3

D. 6

**Answer: B**

Watch Video Solution

**295.** Two coherent sources have intensity ratio of 100 : 1, and are used for obtaining the phenomenon of interference. Then the ratio of maximum and minimum intensity will be –

A. $121:81$

B. $100:1$

C. $101:99$

D. $100:99$

**Answer: A**

Watch Video Solution

**296.** What is the condition of phase difference for destructive interference?

A. $0, 2\pi, 4\pi, 6\pi$.....

B. $\frac{\pi}{2}, \frac{3\pi}{2}, \frac{5\pi}{2}, \frac{7\pi}{2}$

C. $\pi, 3\pi, 5\pi, 7\pi$.....

D. $\frac{\pi}{4}, \frac{\pi}{2}, \frac{3\pi}{4}, \pi, \ldots.$

**Answer: C**

Watch Video Solution

**297.** When destrutive interference obtained, the phase difference is

A. $0, 2\pi, 4\pi$,...

B. $\pi, 3\pi, 5\pi, \ldots.$

C. $\frac{\pi}{2}, \frac{3\pi}{2}, \frac{5\pi}{2}, \ldots.$

D. $\frac{\pi}{4}, \frac{\pi}{2}, \frac{3\pi}{4}, \pi, \ldots.$

**Answer: B**

Watch Video Solution

**298.** If path difference between two interfering waves is zero, then the point will be

A. dark

B. bright

C. as it is

D. either dark of bright

**Answer: B**


**299.** The biprism experiment is performed by using first the blue light of wavelength 4800 Å and then with red light. It is found that the fourth bright band of blue light coincides with the third bright band of red light. What is the wavelength of red light?

A. 4800Å

B. 6000Å

C. 6400 Å

D. 5600Å

**Answer: C**

Watch Video Solution

**300.** Band with for red light of wavelength $6400Å$ us 0.32 mm. If red lilght is replaced by blue light of wavelength $4800Å$, then the change in bandwidth will be

A. 4800Å

B. 6000Å

C. 6400Å

D. 5600Å

**Answer: B**

Watch Video Solution

**301.** The disntance of $n^{th}$ brigth band from central band is give by

A. $\frac{(2n-1)\lambda D}{d}$

B. $\frac{n\lambda D}{d}$

C. $\frac{n\lambda d}{D}$

D. $\frac{(2n)\lambda D}{d}$

**Answer: B**

Watch Video Solution

**302.** In a double experiment, the distance between the slit is 1 mm and screen is 25 cm away from the slits. The wavelength of light is $6000\text{Å}$. The width of the fringe on the screen is

A. $0.15mm$

B. $2.24mm$

C. $0.30$ mm

D. $0.12mm$

**Answer: A**

Watch Video Solution

**303.** In a biprism experiment, the optical path difference between the two identical waves arriving at a point is 0.05 cm. if the wavelength of light used of 5000 Å, then the number of dark friges passing through that point will be

A. 10

B. 1000

C. 100

D. 10000

**Answer: B**

Watch Video Solution

**304.** In Young's double slit experiment if wavelength of light is doubled without changing other conditions, the fringe width will

A. be doulbed

B. halved

C. be quadrupled

D. remin unchanged

**Answer: A**

Watch Video Solution

**305.** Two interfering waves are arriving at a point on a screen with a path difference of $120\lambda$. The path difference is

$72\mu m$. The wavelength of light is _____. Is the point dark or bright?

A. 6000Å bright

B. 8640Å, bright

C. 8640Å, dark

D. 6000Å dark

**Answer: A**

Watch Video Solution

**306.** In a Young's double slit experiment set up, slits are kept $0.4$ mm apart from each other screen is kept 2 m apart from slit. The fringe for a givne monochoromatic light is $0.8mm$.

If the whole set up is kept in medium of refractive index $1.6,$ the fringe width becomes

A. $0.4mm$

B. $0.8mm$

C. $0.5$

D. $0.25mm$

**Answer: C**

Watch Video Solution

**307.** If the amplitude of two interfering light waves are not equal, then the intensity in the dark region formed in the interference pattern will be

A. more

B. less

C. same

D. zero

**Answer: A**

Watch Video Solution

**308.** The path difference at a point on the screen in Young's experiment is $5\lambda$. If the distance of that point from the central bright hand is 0.5 mm, then the band width is

A. $2.5mm$

B. $1mm$

C. $0.1$ mm

D. 10 mm

**Answer: C**

Watch Video Solution

**309.** Biprism experiment is conducted with a wavelength of $5000\text{Å}$. The distance between the virtual sources is 0.2 mm and the micrometer eyepiece is at a distance of 100 cm from the slits. The distance between the consecutive bright and dark between the consecutive bright and dark band is

A. $1.25mm$

B. $2.5mm$

C. $3.5mm$

D. $0.25mm$

**Answer: A**

Watch Video Solution

**310.** Monochromatic light has

A. different wavelenghts

B. same wavelengths

C. unidirectional

D. coherent wavelengths

**Answer: B**

Watch Video Solution

**311.** The disntances of poinnt on the screen from two slits are $1.8 \times 10^{-5} m$ and $1.23 \times 10^{-5} m$. If the wavelength of light used is 6000 Å, then the number of bright or dark band formed at that point is

A. $9^{th}$ dark dringe

B. $10^{th}$ dark dringe

C. $10^{th}$ bright fringe

D. $11^{th}$ dark fringe

**Answer: B**

Watch Video Solution

**312.** Two slits separated by a distance of 0.5 mm are illuminated by light of wavelength 5000 Å. The interference fringes are obtained on a screen at a distance of 1.m. what is the phase difference between two interfering waves at a point 3 mm from the central bbright fringe?

A. $5\pi$ radian

B. $2\pi$ radian

C. $3\pi$ radian

D. $6\pi$ radian

**Answer: A**

Watch Video Solution

**313.** In an interference experiment with a biprism, the distance of the slits from the screenn is increased by 25% annd the separation between the slits is halved. If X represents the original fringe width, the new fringe width will be

A. $2.5X$

B. $1.5X$

C. $2X$

D. $4X$

**Answer: A**

Watch Video Solution

**314.** In interference of light, a point is bright if the path difference between the two beams arriving at that point is

A. an integral multiple of the wavelengths

B. an odd multiple of the wavelengths

C. an odd multiple of half of the wavelengths

D. an even multiple of half of the wavelengths

**Answer: A**

Watch Video Solution

**315.** In the biprism experiment keeping the experimental set up unchanged, the fringe width

A. increases with increases in wavelenghts

B. decreases with increases in wavelenghts

C. increases with decreases in wavelenghts

D. remains unchanged with change in wavelengths

**Answer: A**

Watch Video Solution

**316.** If the ratio of amplitude of two waves is $4:3$, then the ratio of maximum and minimum intensity is

A. $16:9$

B. $9:16$

C. $1:49$

D. $49:1$

**Answer: D**

Watch Video Solution

**317.** If a torch is used in place of monochromatic light in Young's experiment what will happen?

A. no fringe will appear

B. only bright will appear

C. fringe will occurs as from monochromatic source

D. fringe will appear for a moment and then it will disappear

**Answer: A**

Watch Video Solution

**318.** Fringes are produced with monochromatic light of wavelengths $4.45 \times 10^{-5}$ cm. A thin glass plate of R.I. 1.5 in then normally placedin one of the paths of interfering waves and the central bright band of the fringe system is found to move into the position, previously occupied by the thrie bright band from the system. The thickness of glass plate will be

A. $32.7 \times 10^{-4} cm$

B. $32.7 \times 10^{-5} cm$

C. $16.7 \times 10^{-5} cm$

D. $12.5 \times 10^{-5} cm$

**Answer: B**

Watch Video Solution

**319.** Light of wavelength 5000Å is incident normally on a slit. The first minimumof the diffraction pattern is formed at adistance of 5 mm from centra maximum. The screen is situated at a distance of 2 m from the slit. The slit width is

A. $0.2mm$

B. $0.8$ mm

C. $0.4mm$

D. $2.0mm$

**Answer: A**

Watch Video Solution

**320.** Light of wavelength 6328 Å is incident normally on a slit of width 0.2 mm. Calculate the angular width of central maximum on a screen distance 9 m?

A. $0.36^\circ$

B. $0.18^\circ$

C. $0.82^\circ$

D. $0.09^\circ$

**Answer: A**

Watch Video Solution

**321.** In two similar interferce experiments, wavelengths of light used were in the ratio $4:5$, the sources ot screen distances were in the ratio $5:6$ and the sources separation in the ration $2:3$. The ratio of their band width is

A. $1:1$

B. $1:2$

C. $2:1$

D. $1:4$

**Answer: A**

Watch Video Solution

**322.** For minimum intensity the phase difference between the two waves is

A. $2\pi n$

B. $(2n-1)\pi$

C. $(2n+3)\pi$

D. $\pi n$

**Answer: B**

Watch Video Solution

**323.** Two light waves of amplitudes $A_1$ and $A_2$ superimpose with each other such that $A_1 > A_2$. The difference between maximum and minimum amplitudes is

A. $A_1$

B. $2A_2$

C. $2A_1$

D. $A_2$

**Answer: B**

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**324.** In a single slit diffraction pattern intensity and width of fringes are

A. unequal width

B. equal width

C. equal width and equal intensity

D. unequal width and unequal intensity

**Answer: D**

Watch Video Solution

**325.** If path difference between is $\frac{11\lambda}{4}$ then the phase difference between two waves will be

A. $11\pi/2$

B. $5\pi/2$

C. $13\pi/2$

D. $7\pi/2$

**Answer: A**

Watch Video Solution

**326.** Resolving power of a telescope can be increased by

A. increasing diameter of the objectiveof the telescope

B. decreasing diameter of the objectiveof the telescope

C. increasin thewavelengths of light

D. none of these

**Answer: A**

Watch Video Solution

**327.** In the experiment of interfernece, p is the number of bright bands for a light of wavelength $\lambda_1$. If the source of

light is replaced by $\lambda_2$ then the number of bright bands will be

A. $p\lambda_2 / \lambda_1$

B. $p\lambda_1 / \lambda_2$

C. $p\lambda_1$

D. $p\lambda_2$

**Answer: B**

Watch Video Solution

**328.** In Young's double-slit experiment, the slits are $2mm$ apart and are illuminated by photons of two wavelengths $\lambda_1 = 12000\text{Å}$ and $\lambda_2 = 10000\text{Å}$. At what minimum distance

from the common central bright fringe on the screen $2m$ from the slit will a bright fringe from one interference pattern coincide with a bright fringe from the other?

A. 6 mm

B. 4 mm

C. 3 mm

D. 8 mm

**Answer: A**

Watch Video Solution

**329.** A parallel beam of fast moving electrons is incident normally on a narrow slit. A fluorescent screen is placed at a

large distance from the slit. If the speed of the electrons is increased, which of the following statements is correct?

A. the angular width of the central maximum of the diffraction pattern will increases

B. the angular width of the central maximum of the diffraction pattern will decrease

C. the angular width of the central maximum will decrease

D. diffraction pattern is not observed on the screen in the case of electrons

**Answer: B**

Watch Video Solution

**330.** Two coherent sources of intensity ratio $\alpha$ interface . In interference pattern $\frac{I_{\max} - I_{\min}}{I_{\max} + I_{\min}} =$

A. $\frac{2\alpha}{1+\alpha}$

B. $\frac{2\sqrt{\alpha}}{1+\alpha}$

C. $\frac{2\alpha}{1+\sqrt{\alpha}}$

D. $\frac{1+\alpha}{2\alpha}$

**Answer: B**

Watch Video Solution

**331.** The distances of a point on the screen from two slits in biprism experiment is $1.8 \times 10^{-5}$ m and $1.23 \times 10^{-5}$ m if

wavelength of light used is 6000 Å then fringe formed at that point is

A. $10^{th}$ bright

B. $10^{th}$ dark

C. $9^{th}$ bright

D. $9^{th}$ dark

**Answer: B**

Watch Video Solution

**332.** Two coherent monochromatic light beams of intensities 4/ and 9/ are superimosed the maxmum and minimum possible intenties in the resulting beam are

A. 3 I and 2 I

B. 9 I and 5 I

C. 16 I and 3 I

D. 25 I and I

**Answer: D**

Watch Video Solution

**333.** In young double slit experiment the ratio of intentsities of bright and dark bands is 16 which means

A. the ratio of their amplitudes is 5

B. intensites of individual source are 25 and 9 unit respectively

C. the ratio of their amplitudes is 4

D. intensities of individual sources are 4 and 3 units respectively

**Answer: B**

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