NEET PHYSICS

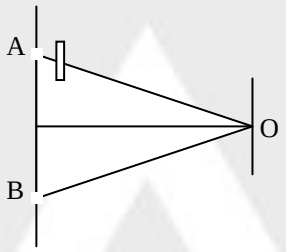
Topic: Wave Optics

Q.1 If a transparent medium of refractive index $\mu = 1.5$ and thickness $t = 2.5 \times 10^{-5}$ m is inserted in front of the slits of Young's Double slit experiment, how much will be the shift in the interference pattern ? The distance between the slits is 0.5 mm and that between slits and screen is 100 cm :

(1) 5 cm (2) 2.5 cm (3) 0.25 cm (4) 0.1 cm

Q.2 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 then :



(1) The fringes will disappear

(2) The fringe width will decrease

(3) The fringe width will increase

(4) There will be no change in the fringe width

(4) There will be no change in the fringe width

Q.3 What is the path difference of destructive interference : -

(1) $n\lambda$ (2) $n(\lambda + 1)$

(3) $\frac{(n+1)\lambda}{2}$ (4) $\frac{(2n+1)\lambda}{2}$

Q.4 A double slit experiment is performed with light of wavelength 500 nm. A thin film of thickness 2 μm and refractive index 1.5 is introduced in the path of the upper beam. The location of the central maximum will :

(1) Remain unshifted

(2) Shift downward by nearly two fringes

(3) Shift upward by nearly two fringes

(4) Shift downward by 10 fringes

Q.5 A monochromatic beam of light is used for the formation of fringes on the screen by illuminating the two slits in the Young's double slit interference experiment. When a thin film of mica is interposed in the path of one of the interfering beams then :

(1) The fringe width increases

(2) The fringe width decreases

(3) The fringe width remains the same but the pattern shifts

(4) The fringe pattern disappears

Q.6 When exposed to sunlight, thin films of oil on water often exhibit brilliant colors due to the phenomenon of -

(1) interference (2) diffraction

(3) dispersion (4) polarisation

Q.7 The ratio of diameters of fourth and ninth half period zone is :

(1) 2/3 (2) 1/18

(3) 1/3 (4) 1/27

Q.8 For a zone plate, the value of $\frac{f_2}{f_1}$ is :

(1) $\frac{2}{5}$ (2) $\frac{5}{2}$ (3) $\frac{3}{9}$ (4) 4

Q.9 The area of third half period zone initiated from a source of wavelength 5000Å at point of projection one metre from the plane wave front will be :

(1) $15.7 \times 10^{-7} m^2$ (2) $47.1 \times 10^{-7} m^2$

(3) $5.1 \times 10^{-7} m^2$ (4) none of the above

Q.10 Diffraction and interference of light refers to :

(1) quantum nature of light

(2) wave nature of light

(3) transverse nature of light

(4) electromagnetic nature of light

Q.11 Two Fresnel's successive half period zones are such that secondary waves originating from corresponding points and approaches towards the observation point have a :

(1) path difference $\lambda/2$ (2) phase difference π

(3) time difference T/2 (4) all of the above

Q.12 A zone plate behave like a :

(1) concave lens (2) convex lens

(3) concave mirror (4) convex mirror

Q.13 Direction of the first secondary maximum in the Fraunhofer diffraction pattern at a single slit is given by (a is the width of the slit) :

(1) a sin $\theta = \frac{\lambda}{2}$ (2) a cos $\theta = \frac{3\lambda}{2}$

(3) a sin $\theta = \lambda$ (4) a sin $\theta = \frac{3\lambda}{2}$

Q.14 The phenomenon of diffraction of light was discovered by :

(1) Huygens (2) Newton

(3) Fresnel (4) Grimaldi

Q.15 Angular width (θ) of central maximum of a diffraction pattern of a single slit does not depend upon :

(1) Distance between slit and source

(2) Wavelength of light used

(3) Width of the slit

(4) Frequency of light used

Q.16 Red light is generally used to observe diffraction pattern from single slit. If green light is used instead of red light, then diffraction pattern **:**

(1) Will be more clear (2) Will be contract

(3) Will be expanded (4) Will not visualize

Q.17 A zone plate of focal length 60 cm, behaves as a convex lens, If wavelength of incident light is 6000Å, then radius of first half period zone will be :

(1) 36×10^{-8} m (2) 6×10^{-8} m

(3) $\sqrt{6} \times 10^{-8}$ m (4) 6×10^{-4} m

Q.18 In diffraction radius of half period zone is proportional to :

(1) $n^{-1/2}$ (2) $n^{1/2}$ (3) n^2 (4) n

Q.19 Polarisation of light proves the -

(A) corpuscular nature of light

(B) quantum nature of light

(C) transverse wave nature of light

(D) longitudinal wave nature of light

Q.20 Waves that cannot be polarised are -

(A) light waves

(B) electromagnetic waves

(C) transverse waves

(D) longitudinal waves

Q.21 The angle of incidence at which reflected light is totally polarised for reflection from air to glass (refractive index n) is –

(A) $\sin^{-1}$ (n) (B) $\sin^{-1}$ (1/n)

(C) $\tan^{-1}$ (1/n) (D) $\tan^{-1}$ (n)

Q.22 The polaroid glass is used in sunglasses as -

(A) it is a fashion

(B) this reduce glare

(C) this is cheaper than other types

(D) this looks more beautiful

Q.23 In propagation of electromagnetic waves the angle between the direction of propagation and plane of polarisation is -

(A) 0º (B) 45º

(C) 90º (D) 180º

Q.24 A beam of light strikes a piece of glass at an angle of incidence of 60º and the reflected beam is completely plane polarised. The refractive index of the glass is -

(A)1.5 (B) $\sqrt{3}$

(C) $\sqrt{2}$ (D) (3/2)

Q.25 The unit of luminous efficiency of an electric bulb is -

(1) watt (2) lumen

(3) lumen/watt (4) lux

Q.26 5 lumen/W is the luminous efficiency of a lamp and its luminous intensity is 35 candela. The power of the lamp is -

(1) 80 watt (2) 176 watt

(3) 88 watt (4) 36 watt

Q.27 A source of light emits a continuous stream of light energy which fall on a given area. Luminous intensity is defined as -

(1) Luminous energy emitted by the source per second

(2) Luminous flux emitted by the source per unit solid angle

(3) Luminous flux falling per unit area of a given surface

(4) Luminous flux coming per unit area of an illuminated surface

Q.28 Candela is the unit of

(1) Magnetic intensity

(2) Gravitational intensity

(3) Electric intensity

(4) Luminous intensity

Q.29 1 lux is equal to -

(1) 1 lumen/m^2 (2) 1 lumen / cm^2

(3) 1 candela / m^2 (4) 1 candela / cm^2

Q.30 An isotorpic source of 2 candela produces flux equal to -

(1) 2π lumen

(2) 4π lumen

(3) 6π lumen

(4) 8π lumen

ANSWER KEY

Que.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Ans.	2	4	4	3	3	1	1	3	1	2
Que.	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
Ans.	4	2	4	4	1	2	4	2	3	4
Que.	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
Ans.	4	2	1	2	3	3	2	4	1	4