

Chapter :- **WAVE OPTICS**

Assignment : 2

Class 12

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|  **Class : XIIth Subject : PHYSICS** **Date : DPP No. : 2** |

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| **Topic :-**.**WAVE OPTICS**  |

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| 1. | For a wave propagating in a medium, identify the property that is independent of the others |
|  | a) | Velocity | b) | Wavelength |
|  | c) | Frequency | d) | All these depend on each other |
|  |  |  |  |  |
| 2. | In Young’s double alit experiment, the seventh maximum with wavelength $λ\_{1}$ is at a distance $d\_{1}$ and the same maximum with wavelength $λ\_{2}$ is at distance$d\_{2}$. Then $d\_{1}/d\_{2}=$  |
|  | a) | $$\frac{λ\_{1}}{λ\_{2}}$$ | b) | $$\frac{λ\_{2}}{λ\_{1}}$$ | c) | $$\frac{λ\_{1}^{2}}{λ\_{2}^{2}}$$ | d) | $$\frac{λ\_{2}^{2}}{λ\_{1}^{2}}$$ |
|  |  |  |  |  |  |  |  |  |
| 3. | An oil flowing on water seems coloured due to interference. For observing this effect, the approximate thickness of the oil film should be |
|  | a) | $$100 Å$$ | b) | $$10000 Å$$ | c) | $$1 mm$$ | d) | $$1 cm$$ |
| 4. | The wave theory of light was given by |
|  | a) | Maxwell  | b) | Planck  | c) | Huygen | d) | Young  |
|  |  |  |  |  |  |  |  |  |
| 5. | In Young’s double slit experiment, the phase difference between the light waves reaching third bright fringe from the central fringe will be $\left(λ=6000Å\right)$ |
|  | a) | Zero | b) | $$2π$$ | c) | $$4π$$ | d) | $$6π$$ |
|  |  |  |  |  |  |  |  |  |
| 6. | Laser beams are used to measure long distance because |
|  | a) | They are monochromatic | b) | They are highly polarized |
|  | c) | They are coherent | d) | They have high degree of parallelism |
|  |  |  |  |  |
| 7. | In the far field diffraction pattern of a single slit under polychromatic illumination, the first minimum with the wavelength $λ\_{1}$ is found to be coincident with the third maximum at $λ\_{2}$. So |
|  | a) | $$3λ\_{1}=0.3λ\_{2}$$ | b) | $$3λ\_{1}=λ\_{2}$$ | c) | $$λ\_{1}=3.5λ\_{2}$$ | d) | $$0.3λ\_{1}=3λ\_{2}$$ |
|  |  |  |  |  |  |  |  |  |
| 8. | White light is used to illuminate the two slits in a Young’s double slit experiment. The separation between slits is *b* and the screen is at a distance $d\left(> >b\right)$ from the slits. At a point on the screen directly in front of one of the slits, certain wavelengths are missing, figure. Some of these missing wavelengths are  |
|  | a) | $$λ=\frac{b^{2}}{d},\frac{2b^{2}}{3d}$$ | b) | $$λ=\frac{b^{2}}{2d},\frac{3b^{2}}{2d}$$ | c) | $$λ=\frac{2b^{2}}{3d}$$ | d) | $$λ=\frac{3b^{2}}{4d}$$ |
| 9. | A beam of light $AO$ is incident on a glass slab $(μ=1.54)$ in a direction as shown in figure. The reflected ray $OB$ is passed through a Nicol prism. On viewing through a Nicole prism, we find on rotating the prism that*A**N**B*33°33°*O* |
|  | a) | The intensity is reduced down to zero and remains zero |
|  | b) | The intensity reduces down some what and rises again |
|  | c) | There is no change in intensity |
|  | d) | The intensity gradually reduces to zero and then again increases |
| 10. | A parallel beam of fast moving electrons is incident normally on a narrow slit. A screen is placed at a large distance from the slit. If the speed of the electrons is increased, which of the following statement is correct? |
|  | a) | Diffraction pattern is not observed on the screen in the case of electrons |
|  | b) | The angular width of the central maximum of the diffraction pattern will increase |
|  | c) | The angular width of the central maximum will decrease |
|  | d) | The angular width of the central maximum will remains the same |
| 11. | Which of the following radiations has the least wavelength |
|  | a) | $γ$-rays | b) | $β$-rays | c) | $α$-rays | d) | $X$-rays |
| 12. | Which of the following waves have the maximum wavelength |
|  | a) | $X$-rays | b) | I.R. rays | c) | UV rays | d) | Radio waves |
|  |  |  |  |  |  |  |  |  |
| 13. | A circular disc is placed in front of a narrow source. When the point of observation is $2 m$ from the disc, then it covers first HPZ. The intensity at this point is $I$. When the point of observation is $25 cm$ from the disc then intensity will be |
|  | a) | $$\left(\frac{R\_{6}}{R\_{2}}\right)^{2}I$$ | b) | $$\left(\frac{R\_{7}}{R\_{2}}\right)^{2}I$$ | c) | $$\left(\frac{R\_{8}}{R\_{2}}\right)^{2}I$$ | d) | $$\left(\frac{R\_{9}}{R\_{2}}\right)^{2}I$$ |
| 14. | A light of wavelength $5890 Å$ falls normally on a thin air film. The minimum thickness of the film such that the film appears dark in reflected light is |
|  | a) | $$2.945×10^{-7}m$$ | b) | $$3.945×10^{-7}m$$ | c) | $$4.95×10^{-7}m$$ | d) | $$1.945×10^{-7}m$$ |
| 15. | Polarizing angle for water is $53°4'$. If light is incident at this angle on the surface of water and reflected, the angle of refraction is |
|  | a) | $$53°4'$$ | b) | $$126°56'$$ | c) | $$36°56'$$ | d) | $$30°4'$$ |
| 16. | In Young’s double slit experiment, the separation between the slit and the screen increases. The fringe width |
|  | a) | Increases | b) | Decreases | c) | Remains unchanged | d) | None of these |
| 17. | In which of the following is the interference due to the division of wavefront? |
|  | a) | Young’s double slit experiment |
|  | b) | Fresnel’s biprism experiment |
|  | c) | Liyod’s mirror experiment |
|  | d) | Demonstration colours of thin film |
| 18. | Air has refractive index 1.0003. The thickness of air column, which will have one more wavelength of yellow light $(6000Å)$ than in the same thickness of vacuum is |
|  | a) | $$2 mm$$ | b) | $$2 cm$$ | c) | $$2 m$$ | d) | $$2 km$$ |
| 19. | A star emitting radiation at a wavelength of $5000Å$ is approaching earth with a velocity of $1.5×10^{6}m/s$. The change in wavelength of the radiation as received on the earth, is |
|  | a) | $$25Å$$ | b) | Zero | c) | $$100Å$$ | d) | $$2.5Å$$ |
| 20. | In Young’s double slit experiment when wavelength used is $6000Å$ and the screen is $40 cm$ from the slits, the fringes are $0.012 cm$ wide. What is the distance between the slits |
|  | a) | $$0.024 cm$$ | b) | $$2.4 cm$$ | c) | $$0.24 cm$$ | d) | $$0.2 cm$$ |