DPP
DAILY PRACTICE PROBLEMS

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

Topic :-WAVE OPTICS

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 distanced_2. Then $d_1/d_2 =$
   a) $\frac{\lambda_1}{\lambda_2}$ b) $\frac{\lambda_2}{\lambda_1}$ c) $\frac{\lambda_1^2}{\lambda_2^2}$ d) $\frac{\lambda_2^2}{\lambda_1^2}$

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 ($\lambda = 6000$Å)
   a) Zero b) 2π c) 4π d) 6π

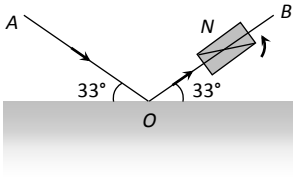
6. Laser beams are used to measure long distance because
   a) They are monochromatic b) They are highly polarized
   c) They are coherent d) They have high degree of parallelism

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) $3\lambda_1 = 0.3\lambda_2$ b) $3\lambda_1 = \lambda_2$ c) $\lambda_1 = 3.5\lambda_2$ d) $0.3\lambda_1 = 3\lambda_2$

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 $d(>>b)$ 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) $\lambda = \frac{b^2}{d}, \frac{2b^2}{3d}$ b) $\lambda = \frac{b^2}{2d}, \frac{3b^2}{2d}$ c) $\lambda = \frac{2b^2}{3d}$ d) $\lambda = \frac{3b^2}{4d}$

9. A beam of light AO is incident on a glass slab ($\mu = 1.54$) 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) 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) $2.945 \times 10^{-7} m$ b) $3.945 \times 10^{-7} m$ c) $4.95 \times 10^{-7} m$ d) $1.945 \times 10^{-7} m$

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 $1.5 \times 10^6 m/s$. 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