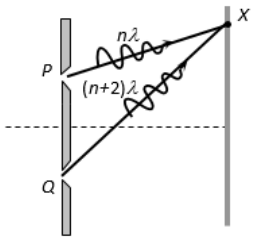
DPP
DAILY PRACTICE PROBLEMS

Class : XIIth **Subject : PHYSICS**
Date : **DPP No. : 3**

Topic :-WAVE OPTICS

1. Which of the following cannot be explained on the basis of wave nature of light?
   I. Polarization
   II. Optical activity
   III. Photoelectric effect
   IV. Compton effect
   a) (iii) and (iv) b) (ii) and (iii) c) (i)and (iii) d) (ii) and (iv)
2. The figure shows a double slit experiment where P and Q are the slits. The path lengths PX and QX are $n\lambda$ and $(n+2)\lambda$ respectively, where n is a whole number and λ is the wavelength. Taking the central fringe as zero, what is formed at X



   a) First bright b) First dark c) Second bright d) Second dark
3. When the angle of incidence on a material is 60°, the reflected light is completely polarized. The velocity of the refracted ray inside the material is (in ms^{-1})
   a) 3×10^8 b) $\left[\frac{3}{\sqrt{2}}\right] \times 10^8$ c) $\sqrt{3} \times 10^8$ d) 0.5×10^8
4. In Young's double slit experiment, if monochromatic light is replaced by white light
   a) All bright fringes become white
   b) All bright fringes have colours between violet and red
   c) Only the central fringe is white, all other fringes are coloured
   d) No fringes are observed
5. By corpuscular theory of light, the phenomenon which can be explained is
   a) Refraction b) Interference c) Diffraction d) Polarization
6. In Young's double slit experiment, the intensity on screen at a point where path difference is λ is K. What will be intensity at the point where path difference is $/4$?
   a) $K/4$ b) $K/2$ c) K d) zero

7. If I_0 is the intensity of the principal maximum in the single slit diffraction pattern, then what will be its intensity when the slit width is doubled?

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

8. Electromagnetic radiation of highest frequency is

a) Infrared radiations b) Visible radiation c) Radio waves d) γ-rays

9. Maximum diffraction takes place in a given slit for

a) $\gamma -$ rays b) Ultraviolet light

c) Infrared light d) Radiowaves

10. In Young's double slit experiment, an interference pattern is obtained on a screen by a light of wavelength 6000Å coming from the coherent sources S_1 and S_2. At certain point P on the screen third dark fringe is formed. Then the path difference $S_1P - S_2P$ in microns is

a) 0.75 b) 1.5 c) 3.0 d) 4.5

11. The two slits at a distance of 1 mm are illuminated by the 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) 0.65 mm b) 1.63 mm c) 3.25 mm d) 4.88 mm

12. To observe diffraction the size of an obstacle

a) Should be of the same order as wavelength b) Should be much larger than the wavelength

c) Have no relation to wavelength d) Should be exactly $\lambda/2$

13. An unpolarised beam of intensity I_0 is incident on a pair of nicols making an angle of 60° with each other. The intensity of light emerging from the pair is

a) I_0 b) $I_0/2$ c) $I_0/4$ d) $I_0/8$

14. A light has amplitude A and angle between analyser and polarizer is 60°. Light is reflected by analyser has amplitude

a) $A\sqrt{2}$ b) $A/\sqrt{2}$ c) $\sqrt{3}A/2$ d) $A/2$

15. Oil floating on water looks coloured due to interference of light. What should be the order of magnitude of thickness of oil layer in order that this effect may be observed?

a) 10,000 Å b) 1 cm c) 10 Å d) 100 Å

16. The wavelength of light observed on the earth, from a moving star is found to decrease by 0.05%. Relative to the earth the star is

a) Moving away with a velocity of $1.5 \times 10^5 m/s$

b) Coming closer with a velocity of $1.5 \times 10^5 m/s$

c) Moving away with a velocity of $1.5 \times 10^4 m/s$

d) Coming closer with a velocity of $1.5 \times 10^4 m/s$

17. An interference pattern was made by using red light. If the red light changes with blue light, the fringes will become

a) Wider b) Narrower c) Fainter d) Brighter

18. 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

19. The theory associated with secondary wavelets is
    a) Doppler's effect
    b) Special theory of relativity
    c) Huygen's wave theory
    d) None of the above
20. A narrow slit of width 2 mm is illuminated by monochromatic light of wavelength 500 nm. The distance between the first minima on either side on a screen at a distance of 1 m is
    a) 5 mm
    b) 0.5 mm
    c) 1 mm
    d) 10 mm