DPP
DAILY PRACTICE PROBLEMS

Class : XIIth   Subject : PHYSICS
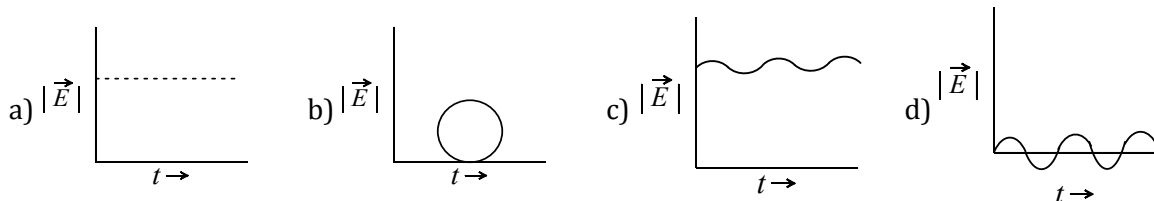Date :   DPP No. : 6

Topic :- WAVE OPTICS

1. Which of the following diagrams represent the variation of electric field vector with time for a circularly polarized light

2. In a Young's experiment, one of the slits is covered with a transparen't sheet of thickness 3.6×10^{-3} cm due to which position of central fringe shifts to a position originally occupied by 30th fringe. The refractive index of the sheet, if $\lambda = 6000$ Å, is
   a) 1.5   b) 1.2   c) 1.3   d) 1.7

3. The range of wavelength of the visible light is
   a) 10 Å to 100 Å   b) 4,000 Å to 8,000 Å   c) 8,000 Å to 10,000 Å   d) 10,000 Å to 15,000 Å

4. Radius of central zone of circular zone plate is $2.3 mm$. Wavelength of incident light is 5893 Å. Source is at a distance of $6m$. Then the distance of first image will be
   a) $9m$ b) $12m$ c) $24m$ d) $36m$

5. A heavenly body is receding from earth such that the fractional change in λ is 1, then its velocity is
   a) c b) $\dfrac{3c}{5}$ c) $\dfrac{c}{5}$ d) $\dfrac{2c}{5}$

6. The phenomenon of polarization of light indicates that
   a) Light is a longitudinal wave
   b) Light is a transverse wave
   c) Light is not a wave
   d) Light travels with the velocity of 3×10^8 ms^{-1}

7. When unpolarised light beam is incident from air onto glass ($n = 1.5$) at the polarizing angle
   a) Reflected beam is polarized 100 percent
   b) Reflected and refracted beams are partially polarized
   c) The reason for (a) is that almost all the light is reflected
   d) All of the above

8. In the adjacent diagram, CP represents a wavefront and AO & BP, the corresponding two rays. Find the condition on θ for constructive interference at P between the ray BP and reflected ray OP
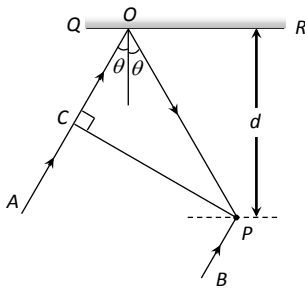
   a) $\cos\theta = 3\lambda/2d$ b) $\cos\theta = \lambda/4d$ c) $\sec\theta - \cos\theta = \lambda/d$ d) $\sec\theta - \cos\theta = 4\lambda/d$

9. The sun is rotating about its own axis. The spectral lines emitted from the two ends of its equator, for an observer on the earth, will show
   a) Shift towards red end
   b) Shift towards violet end
   c) Shift towards red end by one line and towards violet end by other
   d) No shift

10. Evidence for the wave nature of light cannot be obtained from
    a) Reflection   b) Doppler effect   c) Interference   d) Diffraction

11. A mixture of light, consisting of wavelength 590 nm and an unknown wavelength, illuminates Young's double slit and gives rise to two overlapping interference patterns on the screen. The central maximum of both lights coincide. Further, it is observed that the third bright fringe of known light coincides with the 4th bright fringe of unknown light. From this data, the wavelength of the unknown light is
    a) 393.4 nm b) 885.0 nm c) 442.5 nm d) 776.8 nm

12. A single slit Fraunhofer diffraction pattern is formed with white light. For what wavelength of light the third secondary maximum in the diffraction pattern coincides with the second secondary maximum in the pattern for red light of wavelength 6500Å?
    a) 4400 Å   b) 4100 Å   c) 4642.8 Å   d) 9100 Å

13. A narrow slit of width $2mm$ is illuminated by monochromatic light of wavelength $500nm$. The distance between the first minima on either side on a screen at a distance of $1m$ is
    a) $5mm$ b) $0.5mm$ c) $1mm$ d) $10mm$

14. Which of following can not be polarized
    a) Radio waves   b) Ultraviolet rays   c) Infrared rays   d) Ultrasonic waves

15. In Young's experiment, the distance between the slits is reduced to half and the distance between the slit and screen is doubled, then the fringe width
    a) Will not change   b) Will become half
    c) Will be doubled   d) Will become four times

16. In a Young's double slit experiment using red and blue lights of wavelengths 600 nm and 480 nm respectively, the value of n from which the nth red fringe coincides with $(n + 1)$ the blue fringe is
    a) 5   b) 4   c) 3   d) 2

17. In Young's experiment, the third bright band for light of wavelength 6000 Å coincides with the

fourth bright band for another source of light in the same arrangement. Then the wavelength of second source is

a) 3600 Å   b) 4000 Å   c) 5000 Å   d) 4500 Å

18. In Fresnel's biprism ($\mu = 1.5$) experiment the distance between source and biprism is 0.3 m and that between biprism and screen is $0.7m$ and angle of prism is 1°. The fringe width with light of wavelength 6000 Å will be

a) 3 cm b) 0.011 cm c) 2 cm d) 4 cm

19. The rectilinear propagation of light in a medium is due to its

a) High Velocity   b) Large wavelength   c) High frequency   d) Source

20. If an interference pattern has 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