DPP
DAILY PRACTICE PROBLEMS

Class : XIIth **Subject : PHYSICS**
Date : **DPP No. : 10**

Topic :- RAY OPTICS AND OPTICAL INSTRUMENTS

1. Focal length of a convex lens of refractive index 1.5 in 2 cm. Focal length of lens when immersed in a liquid of refractive index of 1.25 will be
   a) 10 cm b) 2.5 cm c) 5 cm d) 7.5 cm
2. When a plane electromagnetic wave enters a glass slab, then which of the following will not change?
   a) Wavelength b) Frequency c) Speed d) Amplitude
3. A thick plane mirror shows a number of images of the filament of an electric bulb. Of these, the brightest image is the
   a) First b) Second c) Fourth d) Last
4. To get three images of a single object, one should have two plane mirrors at an angel of
   a) 60° b) 90° c) 120° d) 30°
5. When the length of a microscope tube increases, its magnifying power
   a) Decreases b) Increases
   c) Does not change d) May decrease or increase
6. Focal length of a convex lens will be maximum for
   a) Blue light b) Yellow light c) Green light d) Red light
7. The focal lengths of the objective and of the eye-piece of a compound microscope are f_0 and f_e respectively. If L is the tube length and D, the least distance of distinct vision, then its angular magnification, when the image is formed at infinity, is
   a) $\left(1-\frac{L}{f_0}\right)\left(\frac{D}{f_e}\right)$ b) $\left(1+\frac{L}{f_0}\right)\left(\frac{D}{f_e}\right)$ c) $\frac{L}{f_0}\left(1-\frac{D}{f_e}\right)$ d) $\frac{L}{f_0}\left(\frac{D}{f_e}\right)$
8. Given the width of aperture = 3 mm and $\lambda = 500$ nm. For what distance ray optics is good approximation?
   a) 18 m b) 18 mm c) 18 Å d) 18 light years
9. A fish in water (refractive index n) looks at a bird vertically above in the air.If y is the height of the bird and x is the depth of the fish from the surface, then the distance of the bird as estimated by the fish is
   a) $x + y\left(1 - \frac{1}{n}\right)$ b) $x + ny$ c) $x + y\left(1 + \frac{1}{n}\right)$ d) $y + x\left(1 - \frac{1}{n}\right)$

10. A man standing in a swimming pool looks at a stone lying at the bottom. The depth of the swimming pool is h. At what distance from the surface of water is the image of the stone formed (Line of vision is normal; Refractive index of water is n)

a) h/n b) n/h c) h d) hn

11. A thin prism P of refracting angle 3° and refractive index 1.5 is combined with another thin prism $Q$of refractive index 1.6 to produce dispersion without deviation. Then the angle of prism Q is

a) 3° b) 4° c) 3.5° d) 2.5°

12. The communication using optical fibres is based on the principle of

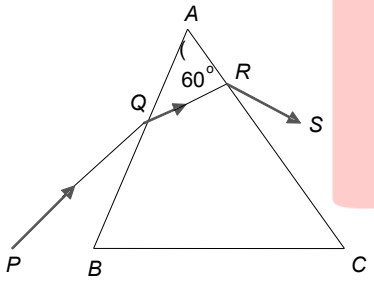
a) Total internal reflection b) Brewster angle

c) Polarization d) Resonance

13. The light ray is incidence at angle of 60° on a prism of angle 45°. When the light ray falls on the other surface at 90°, the refractive index of the material of prism μ and the angle of deviation δ are given by

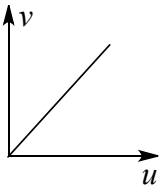
a) $\mu = \sqrt{2}, \delta = 30°$ b) $\mu = 1.5, \delta = 15°$ c) $\mu = \frac{\sqrt{3}}{2}, \delta = 30°$ d) $\mu = \sqrt{\frac{3}{2}}, \delta = 15°$

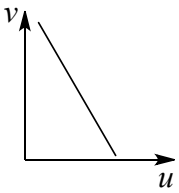
14. A ray PQ incident on the refracting face $BA$is refracted in the prism BACas shown in the figure and emerges from the other refracting face ACas RS,such that $AQ = AR$.If the angle of prism $A = 60°$ and the refractive index of the material of prism is $\sqrt{3}$, then the angle of deviation of the ray is

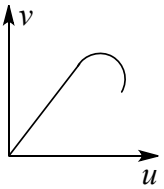


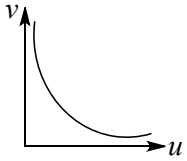
a) 60° b) 45° c) 30° d) None of these

15. The distance v of the real image formed by a convex lens is measured for various object distance u. A graph is plotted between v and u. Which one of the following graphs is correct?

a) 

b) 

c) 

d) 

16. The focal length of the field lens (which is an achromatic combination of two lenses) of telescope is 90 cm. The dispersive powers of the two lenses in the combination are 0.024 and 0.036. The focal lengths of two lenses are

a) 30 cm and 60 cm b) 30 cm and -45 cm c) 45 cm and 90 cm d) 15 cm and 45 cm

17. F_1andF_2 are focal lengths of objective and eyepiece respectively of the telescope. The angular

magnification for the given telescope is equal to

a) $\frac{F_1}{F_2}$ b) $\frac{F_2}{F_1}$ c) $\frac{F_1F_2}{F_1+F_2}$ d) $\frac{F_1+F_2}{F_1F_2}$

18. Continuous emission spectrum is produced by
    a) Incandescent electric lamp b) Mercury vapour lamp
    c) Sodium vapour lamp d) The sun
19. A ray of light falls on the surface of a spherical glass paper weight making an angle α with the normal and is refracted in the medium at an angle β. The angle of deviation of the emergent ray from the direction of the incident ray
    a) $(\alpha-\beta)$ b) $2(\alpha-\beta)$ c) $(\alpha-\beta)/2$ d) $(\beta-\alpha)$
20. A convex lens
    a) Converges light rays b) Diverges light rays
    c) Form real images always d) Always forms virtual images