DPP
DAILY PRACTICE PROBLEMS

Class : XIIth **Subject : PHYSICS**
Date : **DPP No. : 1**

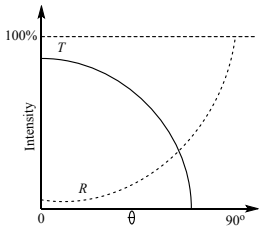
Topic :- RAY OPTICS AND OPTICAL INSTRUMENTS

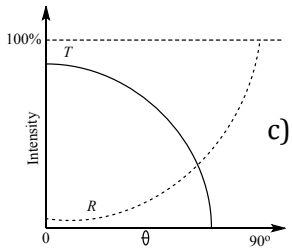
1. A convex lens is in contact with concave lens. The magnitude of the ratio of their focal length is 2/3. Their equivalent focal length is 30 cm. What are their individual focal lengths?
   a) -75, 50 b) -10, 15 c) 75, 50 d) -15, 10
2. A diver inside water ($\mu = 1.33$) should see the sun set at an angle of
   a) 60° b) 90° c) 0° d) 49°
3. A plano convex lens of ($f = 20$ cm) is silvered at plane surface. New f will be
   a) 20 cm b) 40 cm c) 30 cm d) 10 cm
4. If I_1 and I_2 be the size of the images respectively for the two positions of lens in the displacement method, then the size of the object is given by
   a) I_1/I_2 b) $I_1 \times I_2$ c) $\sqrt{I_1 \times I_2}$ d) $\sqrt{I_1/I_2}$
5. The plane faces of two identical plano-convex lenses each having a focal length of 50 cm are placed against each other to form a usual biconvex lens. The distance from this lens combination at which an object must be placed to obtain a real, inverted image which has the same size as the object is
   a) 50 cm b) 25 cm c) 100 cm d) 40 cm
6. Finger prints on a piece of paper may be detected by sprinkling fluorescent powder on the paper and then looking it into
   a) Mercury light b) Sunlight c) Infrared light d) Ultraviolet light
7. An astronomical telescope has objective and eye-piece lenses of powers 0.5 D and 20 D respectively. What will be its magnifying power?
   a) 30 b) 10 c) 40 d) 20
8. The focal lengths of the objective and eyelenses of a microscope are 1.6 cm and 2.5 cm respectively. The distance between the two lenses is 21.7 cm. If the final image is formed at infinity, the distance between the object and the objective lens is
   a) 1.8 cm b) 1.70 cm c) 1.65 cm d) 1.75 cm
9. On which of the following does the magnifying power of a telescope depends
   a) The focal length of the objective only
   b) The diameter of aperture of the objective only
   c) The focal length of the objective and that of the eye piece
   d) The diameter of aperture of the objective and that of the eye piece

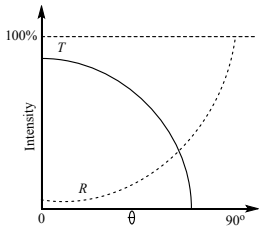
10. The minimum distance between an object and its real image formed by a convex lens is

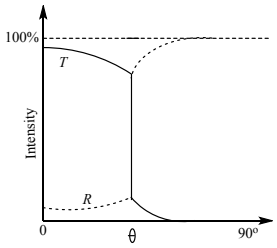
a) 1.5 f b) 2 f c) 2.5 f d) 4 f

11. A symmetric double convex lens is cut in two equal parts by a plane perpendicular to the principle axis. If the power of the original lens is 4D, the power of a cut lens will be
    a) 2D b) 3D c) 4D d) 5D
12. A light ray travelling in glass medium is incident on glass-air interface at an angle of incidence θ. The reflected (R) and transmitted (T) intensities, both as function of θ, are plotted. The correct sketch is

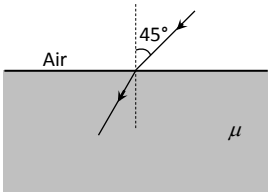
a) 

b) 

c) 

d) 

13. An object is placed at 15 cm from a convex lens of focal length 10 cm. Where should another convex mirror of radius 12 cm be placed such that image will coincide with the object.
    a) 19.3 cm b) 18 cm c) 33 cm d) 22 cm
14. A lens made of glass whose index of refraction is 1.60 has a focal length of +20 cm in air. Its focal length in water, whose refractive index is 1.33, will be
    a) Three times longer than in air b) Two times longer than in air
    c) Same as in air d) None of the above
15. The frequency of a light ray is $6 \times 10^{14} Hz$. Its frequency when it propagates in a medium of refractive index 1.5, will be
    a) $1.67 \times 10^{14} Hz$ b) $9.10 \times 10^{14} Hz$ c) $6 \times 10^{14} Hz$ d) $4 \times 10^{14} Hz$
16. In the figure shown, for an angle of incidence 45°, at the top surface, what is the minimum refractive index needed for total internal reflection at vertical face



a) $\frac{\sqrt{2}+1}{2}$ b) $\sqrt{\frac{3}{2}}$ c) $\sqrt{\frac{1}{2}}$ d) $\sqrt{2}+1$

17. A lens behaves as a converging lens in air and a diverging lens in water. The refractive index of the material is
    a) Equal to unity b) Equal to 1.33
    c) Between unity and 1.33 d) Greater than 1.33
18. Which one of the following alternative is FALSE for a prism placed in a position of minimum deviation
    a) $i_1 = i_2$ b) $r_1 = r_2$ c) $i_1 = r_1$ d) All of these
19. Lux is equal to
    a) 1 $lumen/m^2$ b) 1 $lumen/cm^2$ c) 1 $candela/m^2$ d) 1 $candela/cm^2$
20. Which of the following is a correct relation
    a) ${}_a\mu_r = {}_a\mu_\omega \times {}_r\mu_\omega$ b) ${}_a\mu_r \times {}_r\mu_\omega = {}_\omega\mu_a$ c) ${}_a\mu_r \times {}_r\mu_a = 0$ d) ${}_a\mu_r / {}_\omega\mu_r = {}_a\mu_\omega$