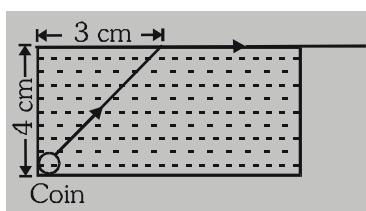


AIPMT 2006

1. A microscope is focussed on a mark on a piece of paper and then a slab of glass of thickness 3 cm and refractive index 1.5 is placed over the mark. How should the microscope be moved to get the mark in focus again :-
 (1) 1 cm upward (2) 4.5 cm downward
 (3) 1 cm downward (4) 2 cm upward
2. A convex lens and a concave lens, each having same focal length of 25 cm, are put in contact to form a combination of lenses. The power in diopters of the combination is :-
 (1) 25 (2) 50 (3) Infinite (4) Zero

AIPMT 2007

3. The frequency of a light wave in a material is 2×10^{14} Hz and wavelength is 5000 \AA . The refractive index of material will be :
 (1) 1.33 (2) 1.40 (3) 1.50 (4) 3.00
4. A small coin is resting on the bottom of a beaker filled with a liquid. A ray of light from the coin travels upto the surface of the liquid and moves along its surface (see figure).



How fast is the light travelling in the liquid ?

- (1) $1.2 \times 10^8 \text{ m/s}$ (2) $1.8 \times 10^8 \text{ m/s}$
 (3) $2.4 \times 10^8 \text{ m/s}$ (4) $3.0 \times 10^8 \text{ m/s}$

AIPMT 2008

5. Two thin lenses of focal lengths f_1 and f_2 are in contact and coaxial. The power of the combination is :-

- (1) $\frac{f_1 + f_2}{2}$ (2) $\frac{f_1 + f_2}{f_1 f_2}$ (3) $\sqrt{\frac{f_1}{f_2}}$ (4) $\sqrt{\frac{f_2}{f_1}}$

AIPMT (Pre) 2010

6. A lens having focal length f and aperture of diameter d forms an image of intensity I . Aperture of diameter $\frac{d}{2}$ in central region of lens is covered by a black paper. Focal length of lens and intensity of image now will be respectively :-
 (1) $\frac{f}{2}$ and $\frac{I}{2}$ (2) f and $\frac{I}{4}$
 (3) $\frac{3f}{4}$ and $\frac{I}{2}$ (4) f and $\frac{3I}{4}$
7. A ray of light travelling in a transparent medium of refractive index μ , falls on a surface separating the medium from air at an angle of incidence of 45° . For which of the following value of μ the ray can undergo total internal reflection ?
 (1) $\mu = 1.25$ (2) $\mu = 1.33$
 (3) $\mu = 1.40$ (4) $\mu = 1.50$

AIPMT (Mains) 2010

8. The speed of light in media M_1 and M_2 is $1.5 \times 10^8 \text{ m/s}$ and $2.0 \times 10^8 \text{ m/s}$ respectively. A ray of light enters from medium M_1 to M_2 at an incidence angle i . If the ray suffers total internal reflection, the value of i is :-
 (1) Equal to or less than $\sin^{-1}\left(\frac{3}{5}\right)$
 (2) Equal to or greater than $\sin^{-1}\left(\frac{3}{4}\right)$
 (3) Less than $\sin^{-1}\left(\frac{2}{3}\right)$
 (4) Equal to $\sin^{-1}\left(\frac{2}{3}\right)$

9. A ray of light is incident on a 60° prism at the minimum deviation position. The angle of refraction at the first face (i.e., incident face) of the prism is :-
 (1) 30° (2) 45°
 (3) 60° (4) Zero

AIPMT (Pre) 2011

10. Which of the following is not due to total internal reflection ?
(1) Working of optical fibre
(2) Difference between apparent and real depth of a pond
(3) Mirage on hot summer days
(4) Brilliance of diamond
11. A biconvex lens has a radius of curvature of magnitude 20 cm. Which one of the following options describe best the image formed of an object of height 2 cm placed 30 cm from the lens ?
($\mu = 1.5$)
(1) Virtual, upright, height = 1 cm
(2) Virtual, upright, height = 0.5 cm
(3) Real, inverted, height = 4 cm
(4) Real, inverted, height = 1 cm

AIPMT (Mains) 2011

12. A thin prism of angle 15° made of glass of refractive index $\mu_1 = 1.5$ is combined with another prism of glass of refractive index $\mu_2 = 1.75$. The combination of the prisms produces dispersion without deviation. The angle of the second prism should be :-
(1) 5° (2) 7° (3) 10° (4) 12°

AIPMT (Pre) 2012

13. The magnifying power of a telescope is 9. When it is adjusted for parallel rays, the distance between the objective and eyepiece is 20 cm. The focal length of lenses are :
(1) 18 cm, 2 cm (2) 11 cm, 9 cm
(3) 10 cm, 10 cm (4) 15 cm, 5 cm
14. A ray of light is incident at an angle of incidence, i , on one face of a prism of angle A (assumed to be small) and emerges normally from the opposite face. If the refractive index of the prism is μ , the angle of incidence i , is nearly equal to :
(1) A/μ (2) $A/2\mu$ (3) μA (4) $\frac{\mu A}{2}$

15. A concave mirror of focal length ' f_1 ' is placed at a distance of ' d ' from a convex lens of focal length ' f_2 '. A beam of light coming from infinity and falling on this convex lens-concave mirror combination returns to infinity. The distance ' d ' must equal :
(1) $2f_1 + f_2$ (2) $-2f_1 + f_2$
(3) $f_1 + f_2$ (4) $-f_1 + f_2$
16. When a biconvex lens of glass having refractive index 1.47 is dipped in a liquid, it acts as a plane sheet of glass. This implies that the liquid must have refractive index.
(1) greater than that of glass
(2) less than that of glass
(3) equal to that of glass
(4) less than one

AIPMT (Mains) 2012

17. A rod of length 10 cm lies along the principal axis of a concave mirror of focal length 10 cm in such a way that its end closer to the pole is 20 cm away from the mirror. The length of the image is :-
(1) 2.5 cm (2) 5 cm
(3) 10 cm (4) 15 cm
18. For the angle of minimum deviation of a prism to be equal to its refracting angle, the prism must be made of a material whose refractive index :-
(1) is less than 1
(2) is greater than 2
(3) lies between $\sqrt{2}$ and 1
(4) lies between 2 and $\sqrt{2}$

NEET-UG 2013

19. A plano convex lens fits exactly into a plano concave lens. Their plane surfaces are parallel to each other. If lenses are made of different materials of refractive indices μ_1 and μ_2 and R is the radius of curvature of the curved surface of the lenses, then the focal length of combination is
(1) $\frac{2R}{(\mu_2 - \mu_1)}$ (2) $\frac{R}{2(\mu_1 + \mu_2)}$
(3) $\frac{R}{2(\mu_1 - \mu_2)}$ (4) $\frac{R}{(\mu_1 - \mu_2)}$

20. For a normal eye, the cornea of eye provides a converging power of 40 D and the least converging power of the eye lens behind the cornea is 20 D. Using this information, the distance between the retina and the cornea eye lens can be estimated to be -

- (1) 1.5 cm (2) 5 cm
(3) 2.5 cm (4) 1.67 cm

AIPMT 2014

21. If the focal length of objective lens is increased then magnifying power of :-
- (1) microscope will increase but that of telescope decrease.
(2) microscope and telescope both will increase.
(3) microscope and telescope both will decrease
(4) microscope will decrease but that of telescope increase.
22. The angle of a prism is 'A'. One of its refracting surfaces is silvered. Light rays falling at an angle of incidence $2A$ on the first surface returns back through the same path after suffering reflection at the silvered surface. The refractive index μ , of the prism is :-

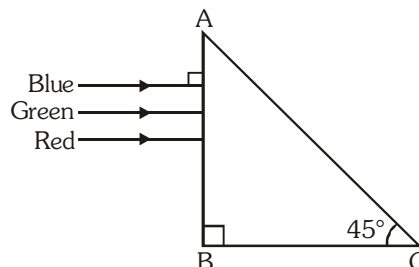
- (1) $2\sin A$ (2) $2\cos A$ (3) $\frac{1}{2}\cos A$ (4) $\tan A$

AIPMT 2015

23. The refracting angle of a prism is A , and refractive index of the material of the prism is $\cot(A/2)$. The angle of minimum deviation is :-
- (1) $180^\circ - 2A$ (2) $90^\circ - A$
(3) $180^\circ + 2A$ (4) $180^\circ - 3A$
24. Two identical thin plano-convex glass lenses (refractive index 1.5) each having radius of curvature of 20 cm are placed with their convex surfaces in contact at the centre. The intervening space is filled with oil of refractive index 1.7. The focal length of the combination is :-
- (1) -25 cm (2) -50 cm
(3) 50 cm (4) -20 cm

Re-AIPMT 2015

25. A beam of light consisting of red, green and blue colours is incident on a right angled prism. The refractive index of the material of the prism for the above red, green and blue wavelengths are 1.39, 1.44 and 1.47, respectively.



The prism will :-

- (1) separate the red colour part from the green and blue colours
(2) separate the blue colour part from the red and green colours
(3) separate all the three colours from one another
(4) not separate the three colours at all

NEET-I 2016

26. The angle of incidence for a ray of light at a refracting surface of a prism is 45° . The angle of prism is 60° . If the ray suffers minimum deviation through the prism, the angle of minimum deviation and refractive index of the material of the prism respectively, are :

- (1) $45^\circ, \frac{1}{\sqrt{2}}$ (2) $30^\circ, \sqrt{2}$
(3) $45^\circ, \sqrt{2}$ (4) $30^\circ, \frac{1}{\sqrt{2}}$

27. An astronomical telescope has objective and eyepiece of focal lengths 40 cm and 4 cm respectively. To view an object 200 cm away from the objective, the lenses must be separated by a distance :-
- (1) 37.3 cm
(2) 46.0 cm
(3) 50.0 cm
(4) 54.0 cm

28. Match the corresponding entries of **column-1** with **column-2** (Where m is the magnification produced by the mirror) :-

Column-1

(A) $m = -2$

(B) $m = -\frac{1}{2}$

(C) $m = +2$

(D) $m = +\frac{1}{2}$

Column-2

(a) Convex mirror

(b) Concave mirror

(c) Real image

(d) Virtual image

- (1) A \rightarrow b and c, B \rightarrow b and c, C \rightarrow b and d, D \rightarrow a and d.
 (2) A \rightarrow a and c, B \rightarrow a and d, C \rightarrow a and b, D \rightarrow c and d
 (3) A \rightarrow a and d, B \rightarrow b and c, C \rightarrow b and d, D \rightarrow b and c
 (4) A \rightarrow c and d, B \rightarrow b and d, C \rightarrow b and c, D \rightarrow a and d

NEET-II 2016

29. Two identical glass ($\mu_g = 3/2$) equiconvex lenses of focal length f each are kept in contact. The space between the two lenses is filled with water ($\mu_w = 4/3$). The focal length of the combination is :-
 (1) $4f/3$ (2) $3f/4$ (3) $f/3$ (4) f
30. An air bubble in a glass slab with refractive index 1.5 (near normal incidence) is 5 cm deep when viewed from one surface and 3 cm deep when viewed from the opposite face. The thickness (in cm) of the slab is :-
 (1) 12 (2) 16 (3) 8 (4) 10
31. A person can see clearly objects only when they lie between 50 cm and 400 cm from his eyes. In order to increase the maximum distance of distinct vision to infinity, the type and power of the correcting lens, the person has to use, will be :-
 (1) concave, -0.2 diopter
 (2) convex, $+0.15$ diopter
 (3) convex, $+2.25$ diopter
 (4) concave, -0.25 diopter

NEET(UG) 2017

32. A beam of light from a source L is incident normally on a plane mirror fixed at a certain distance x from the source. The beam is reflected back as a spot on a scale placed just above the source L. When the mirror is rotated through a small angle θ , the spot of the light is found to move through a distance y on the scale. The angle θ is given by :-
 (1) $\frac{y}{x}$ (2) $\frac{x}{2y}$ (3) $\frac{x}{y}$ (4) $\frac{y}{2x}$
33. A thin prism having refracting angle 10° is made of glass of refractive index 1.42. This prism is combined with another thin prism of glass of refractive index 1.7. This combination produces dispersion without deviation. The refracting angle of second prism should be :-
 (1) 6° (2) 8° (3) 10° (4) 4°

NEET(UG) 2018

34. The refractive index of the material of a prism is $\sqrt{2}$ and the angle of the prism is 30° . One of the two refracting surfaces of the prism is made a mirror inwards, by silver coating. A beam of monochromatic light entering the prism from the other face will retrace its path (after reflection from the silvered surface) if its angle of incidence on the prism is :-
 (1) 60° (2) 45°
 (3) 30° (4) zero
35. An object is placed at a distance of 40 cm from a concave mirror of focal length 15 cm. If the object is displaced through a distance of 20 cm towards the mirror, the displacement of the image will be:-
 (1) 30 cm away from the mirror
 (2) 36 cm away from the mirror
 (3) 30 cm towards the mirror
 (4) 36 cm towards the mirror

NEET(UG) 2019

36. Which colour of the light has the longest wavelength?
 (1) red (2) blue (3) green (4) violet

37. Pick the **wrong** answer in the context with rainbow.

- (1) When the light rays undergo two internal reflections in a water drop, a secondary rainbow is formed.
- (2) The order of colours is reversed in the secondary rainbow.
- (3) An observer can see a rainbow when his front is towards the sun.
- (4) Rainbow is a combined effect of dispersion refraction and reflection sunlight.

38. Two similar thin equi-convex lenses, of focal length

f each, are kept coaxially in contact with each other such that the focal length of the combination is F_1 . When the space between the two lenses is filled with glycerin (which has the same refractive index ($\mu = 1.5$) as that of glass) then the equivalent focal length is F_2 . The ratio $F_1 : F_2$ will be :

- (1) 2 : 1
- (2) 1 : 2
- (3) 2 : 3
- (4) 3 : 4

39. In total internal reflection when the angle of incidence is equal to the critical angle for the pair of media in contact, what will be angle of refraction?

- (1) 180°
- (2) 0°
- (3) equal to angle of incidence
- (4) 90°

NEET(UG) 2019 (Odisha)

40. An equiconvex lens has power P . It is cut into two symmetrical halves by a plane containing the principal axis. The power of one part will be :

- (1) 0
- (2) $\frac{P}{2}$
- (3) $\frac{P}{4}$
- (4) P

41. A double convex lens has focal length 25 cm. The radius of curvature of one of the surfaces is double of the other. Find the radii if the refractive index of the material of the lens is 1.5 :

- (1) 100 cm, 50 cm
- (2) 25 cm, 50 cm
- (3) 18.75 cm, 37.5 cm
- (4) 50 cm, 100 cm

| Que. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Ans. | 1 | 4 | 4 | 2 | 2 | 4 | 4 | 2 | 1 | 2 | 3 | 3 | 1 | 3 | 2 |
| Que. | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| Ans. | 3 | 2 | 4 | 4 | 4 | 4 | 2 | 1 | 2 | 1 | 2 | 4 | 1 | 2 | 1 |
| Que. | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | | | | |
| Ans. | 4 | 4 | 1 | 2 | 2 | 1 | 3 | 2 | 4 | 4 | 3 | | | | |