PHYSICS

BOOKS - BITSAT GUIDE

RAY OPTICS

Others

1. A hair dresser stand with her nose $20cm$ infront of a lane mirror. For what distance

must she focus her eyes in order to see her nose in the mirro?

A. $40cm$

B. $50cm$

C. $30cm$

D. $60cm$

Answer:

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2. Two plane mirrors each 1.6 m long, are facing each other. The distance between the mirrors is

20 cm. A light incident on one end of one of the mirrors at an angle of incidence of 30°. How many times is the ray reflected before it reaches the other end?

A. There are 15 reflections counting the first one

B. There are 13 refelections counting the first one

C. There are 12 reflections counting the first one

D. None of the above

Answer:

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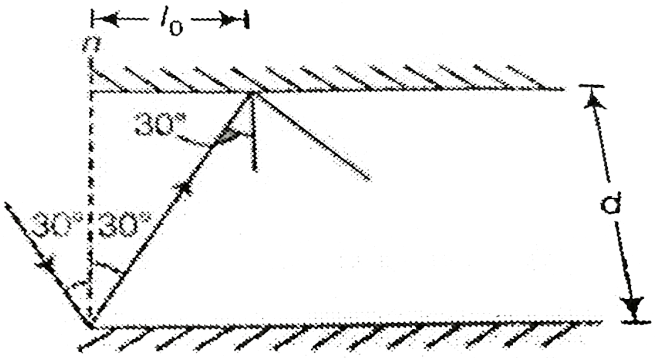
3. A pole $5m$ high is situated on a horizontal surface. Sun rays are incident at an angle 30° with the vertical. The size of shadow on horizontal surface is



A. $5m$

B. $\frac{5}{\sqrt{3}}m$

C. $\frac{10}{\sqrt{3}}m$

D. none of these

Answer:

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4. A beautiful girl with two normal eye wants to see full width of her face by a plane mirror. The eye to eye and ear to ear distances of her face are 4 inch and 6 inch respectively. Find the minimum width of the required mirror.

A. 1 inch

B. 2 inch

C. 3 inch

D. 4 inch

Answer:

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5. A ray of light falls on a plane mirror. When the mirror is turned, about an axis at right angle to the plane of the mirror through 20°, the angle between the incident ray and new

reflected ray is 45°. Find the angle between the incident ray and original reflected ray.

A. 15°

B. 30°

C. 45°

D. 60°

Answer:

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6. The shortest height of a vertical mirror required to see the entire image of a man, will be

A. one -third the man's height

B. half the man's height

C. two-third the man's height

D. data insufficient

Answer: B

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7. Two plane mirrors are perpendicular to each other. A ray after suffering reflection from the two mirror will be

A. perpendicular to the original ray

B. parallel to the first ray

C. parallel to the first mirror

D. at 45° to the original ray

Answer:

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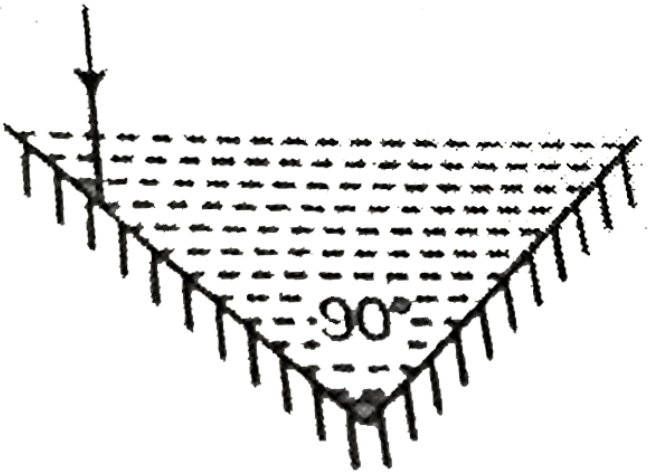
8. A vessel consists of two plane mirrors at right angles (as shown in figure). The vessel is filled with water. The total deviation in incident ray is



A. 0°

B. 90°

C. 180°

D. None of the above

Answer:

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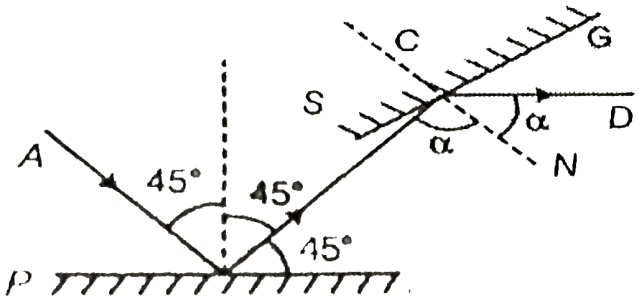
9. A light ray is incident on a horizontal plane mirror at an angle of 45°. At what angle should a second plane mirror be placed in order that the refelcted ray finally be reflected horizontally form the second mirror, as shown

in figure



A. $\theta = 30^\circ$

B. $\theta = 24^\circ$

C. $\theta = 22.5^\circ$

D. $\theta = 67.5^\circ$

Answer:

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10. If two adjacent walls and the ceilling of a rectangular room are mirror surfaced, then how many images of himself, a man can see?

A. 3

B. 5

C. 6

D. 9

Answer:

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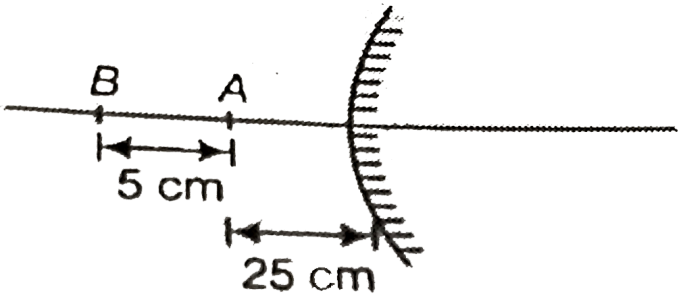
11. A convex mirror of focal length $10cm$ is shown in figure. A linear object $AB = 5cm$ is placed along the optical axis. Point B is at distance $25cm$ from the pole of mirror. The size of image of AB is



A. $\frac{100}{14}\ cm$

B. $\frac{10}{7}\ cm$

C. $\frac{5}{14}\ cm$

D. none of these

Answer: C

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12. If u represents object distance from pole of spherical mirror and V represents image distance from pole of mirror and f is the focal

length of the mirror, then a straight line $u = v$ will cut u versus v graph at

A. (f, f)

B. $(2f, 2f)$

C. $(f, 2f)$

D. $(0, 0)$

Answer:

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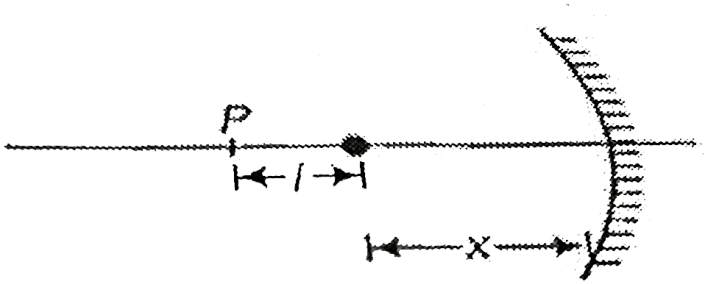
13. A short linear object of length l lies on the axis of a spherical mirror of focal length f, at a distance x from the mirror. Then, the length of the image (P) so obtained will be



A. $\dfrac{If}{(x-f)}$

B. $\dfrac{If^2}{(x-f)^2}$

C. $\dfrac{If}{x}$

D. $\frac{I(x-f)}{x}$

Answer:

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14. A rear view mirror of a vehicle is cylindrical having radius of curvature $10cm$ and length of arc of curved surface is $10cm$. Find the field of view in radian, if it is assume that the eye of the drive is at a large distance from the mirror.

A. 0.5

B. 1

C. 2

D. 4

Answer:

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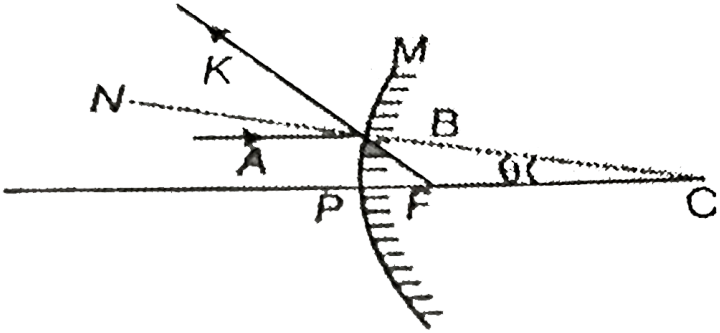
15. In the figure AB and BK represents incident and reflected rays. If angle $BCF = \theta$

then $\angle BFP$ will equal to



A. θ

B. 2θ

C. 3θ

D. 3.5θ

Answer:

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16. Find the position of $1cm$ tall object which is plced $8cm$ infront of a concave mirror of radius is curvature $24cm$.

A. $24cm$

B. $25cm$

C. $26cm$

D. $27cm$

Answer:

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17. A convex driving mirror of focal length $20cm$, is fitted in a motor car. If the second car $2m$ broad and $1.6m$ hight is $6m$ away from first car and overtake the first car at a relative speed of $15m/s$, then how fast will the image he moving?

A. $0.016m/s$

B. $0.0257m/s$

C. $0.162cm$

D. $0.0073 m / s$

Answer:

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18. When an object is placed at a distance of 25 cm from a mirror, the magnification is m_1. The object is moved 15cm farther away with respect to the earlier position, and the magnification becomes m_2. If $m_1 / m_2 = 4$, then calculate the focal length of the mirror.

A. $20cm$ convex

B. $20cm$, concave

C. $10cm$, convex

D. $10cm$ concave

Answer:

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19. Two object A and B when placed in turns infront of a concave mirror, give images of equal size. The focal length of the concave

mirror is $7.5cm$ and size of object A is three times the size of object B from the mirror , if A is placed $30cm$ from the mirror.

A. $18cm$

B. $15cm$

C. $20cm$

D. $25cm$

Answer:

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20. An object of height $5cm$ is placed in midway between a concave mirror of radius of curvature $30cm$ and a convex mirror of placed opposite to each other and are $60cm$ apart. Find the position of the image formed by reflection at convexd mirror.

A. $10cm$

B. $20cm$,

C. $15cm$

D. $13cm$

Answer:

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21. The focal length of plano-convex lens, the convex surface of which is silvered is $0.3m$, if μ of the lens is $7/4$, the radius of curvature of the convex surface is

A. $0.45m$

B. $1.05m$

C. $3m$

D. $0.9m$

Answer:

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22. The magnification of a compound microscope is 30 and the focal length of its eye piece is $5cm$. Calculate the magnification produced by the objective, when the image is to be formed at least distance to distinct vision $(25cm)$

A. 5

B. 6

C. 8

D. 10

Answer:

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23. A convergent doublet of separated lens correct for spherical aberration, are separated by $2m$ and has an equivalent focal lenth of

$10cm$. Calculate the focal length of its component lenses.

A. $f_1 = 18cm, f_2 = 10cm$

B. $f_1 = 20cm, f_2 = 28cm$

C. $f_1 = 20cm, f_2 = 18cm$

D. $f_1 = 24cm, f_2 = 18cm$

Answer:

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24. A ray of light falls on a transparent glass slab of refractive index 1.62. What is the angle of incidence if the reflected ray and refracted ray are mutually perpendicular?

A. $\tan^{-1}(1.62)$

B. $\tan^{-1}\left(\frac{1}{1.162}\right)$

C. $\frac{1}{\tan^{-1}(1.62)}$

D. none of these

Answer:

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25. A ray of light travelling in glass $(\mu_g = 3/2)$ is incident on a horizontal glass-air surface at the critical angle θ_C. If a thin layer of water $(\mu_w = 4/3)$ is now poured on the glass-air surface. At what angle will the ray of light emerges into water at glass-water surface?

A. 180°

B. 0°

C. 90°

D. 45°

Answer:

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26. In a medium of refractive index n_1, a monochromatic light of wavelength λ_1 is travelling. When it enters in a denser medium of refractive index n_2, the wavelength of the light in the second medium is

A. $\lambda_1\left(\frac{n_1}{n_2}\right)$

B. $\lambda_1\left(\frac{n_2}{n_1}\right)$

C. $\frac{\lambda_1(n_2-n_1)}{n_2}$

D. $\frac{\lambda_1(n_2-n_1)}{n_1}$

Answer:

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27. A ray of light is incident on the surface of separation of a medium at an angle 45° and is

refracted in the medium at an angle 30°. What will be the speed of light in the medium?

A. $1.96 \times 10^{8} ms^{-1}$

B. $2.12 \times 10^{8} ms^{-1}$

C. $3.18 \times 10^{8} ms^{-1}$

D. $3.33 \times 10^{8} ms^{-1}$

Answer:

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28. The optical path of a monochromatic light is same if, it goes thoruhg $4.0cm$ of glass or $4.5cm$ of water. If the refractive inded of glass is 1.53, the refractive index of the water is

A. 1.30

B. 1.36

C. 1.42

D. 1.46

Answer:

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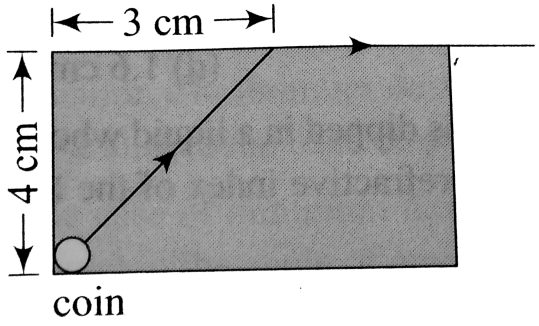
29. A small coin is resting on the bottom of a beaker filled with a liquid. A ray of light from the coin travels up to the surface of the liquid and moves along its surface (see figure).

How fast is the light travelling in the liquid ?



A. $1.8 \times 10^8 ms^{-1}$

B. $2.4 \times 10^8 ms^{-1}$

C. $3.0 \times 10^8 ms^{-1}$

D. $1.2 \times 10^8 ms^{-1}$

Answer:

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30. If c is the velocity of light in vacuum, then find the time taken by the light to travel through a glass plane of thickness t and having refractive index μ.

A. $\left(\frac{t}{\mu c}\right)$

B. $t\mu c$

C. $\frac{\mu t}{c}$

D. $\frac{tc}{\mu}$

Answer:

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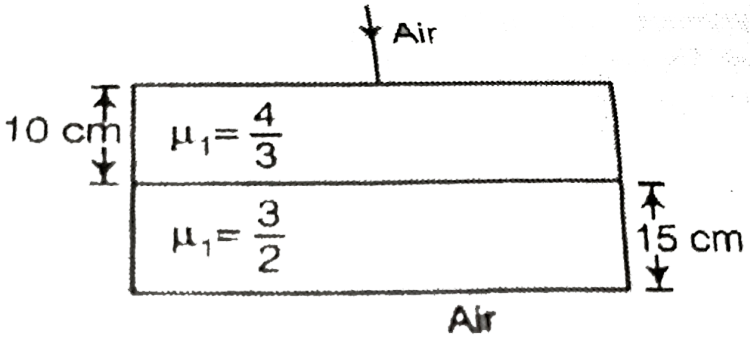
31. Considering normal incident of ray, find equivalent refractive index of combination of

two slabs shown in figure.



A. 1.8

B. 1.43

C. 2

D. none of these

Answer:

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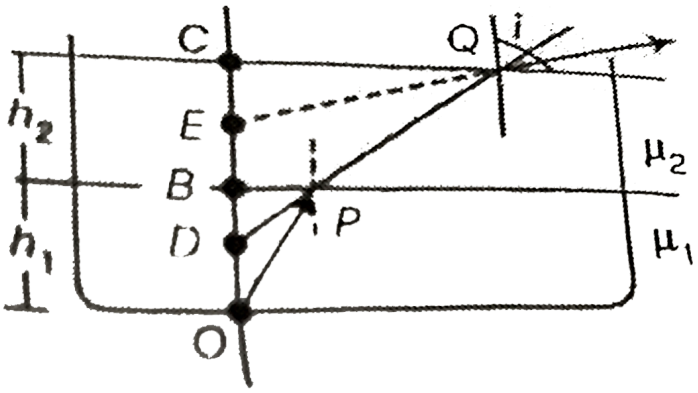
32. A tank contains two different liquids which do not mix with each other. The lower and upper liquid are at depth h_1 and h_2 respectively and of refractive indices μ_1 and μ_2 . An object O is located at the bottom, when see vertically from above. Locate the position of image of the object O as seen from above.



A. $\frac{h_1}{\mu_1} - \frac{h_2}{\mu_2}$

B. $\frac{h_1}{\mu_1} + \frac{h_2}{\mu_2}$

C. $\frac{h_1}{\mu_1} + \frac{h_2}{\mu_1}$

D. $\frac{h_1}{\mu_2} - \frac{h_2}{\mu_1}$

Answer:

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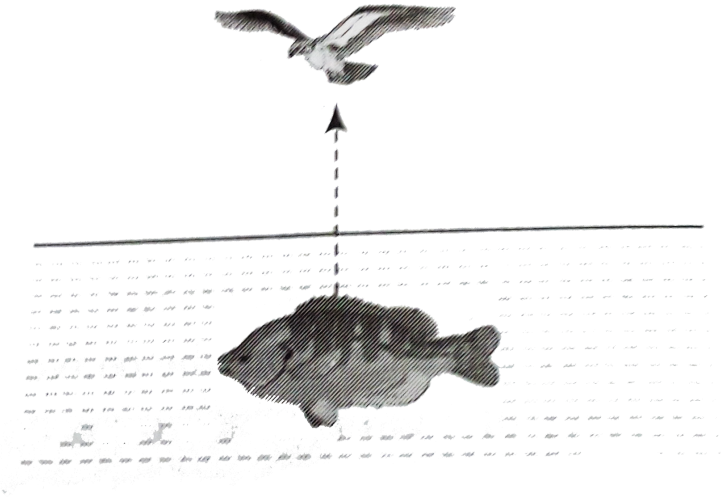
33. A fish rising up vertically toward the surface of water with speed $3ms^{-1}$ observes a bird diving down vertically towards it with

speed $9ms^{-1}$. The actual velocity of bird is



A. $9.2m/s$

B. $4.5m/s$

C. $9.0m/s$

D. $3.2m/s$

Answer:

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34. A compound microscope has a eyepiece of focal length $10m$ and an objective of focal length $4cm$. Calculate the magnification if an object is kept at a distance of $5cm$ from the objective then final image is formed at the least distance of distinct vision.

A. 10

B. 11

C. 12

D. 13

Answer:

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35. A simple microscope consists of a concave lens of power $-10D$ and convex lens of power $+20D$ in contact. If the image formed at infinity, then calculate the magnifying power $(D = 25cm)$

A. 2.5

B. 3.5

C. 2.0

D. 3.0

Answer:

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36. A telescope consists of two lenses of focal lengths $10cm$ and $1cm$. Calculate the length of the telescope, when an object is kept at a distance of $60cm$ from the objective, and the

final image is formed at least distance of distinct vision.

A. $15.05cm$

B. $12.96cm$

C. $13.63cm$

D. $14.44cm$

Answer:

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37. Calculate the limit of resolution of microscope if the numerical apperture of microscopo is 0.12 and the wavelength of light used is $600cm$

A. $0.3\mu m$

B. $1.2\mu m$

C. $2.3\mu m$

D. $3\mu m$

Answer:

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38. An equilateral deviates a ray through 45° for the two angle of incidence differing by 20°. The angle of incidence is

A. 60°

B. 40°

C. 120°

D. none of these

Answer:

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39. Find the refractive index of the material of prism if a thin prism of angle $A = 6^\circ$ produces a deviation $\delta = 3^\circ$.

A. 1.5

B. 1.2

C. 1.1

D. 1.25

Answer:

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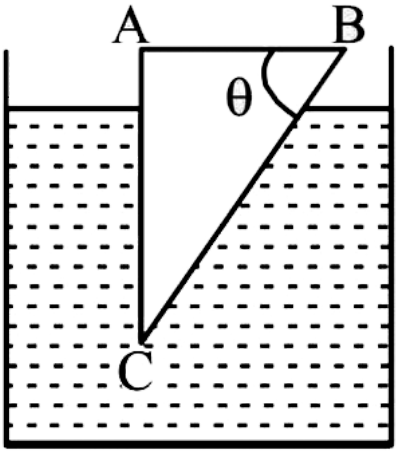
40. A glass prism of refractive index 1.5 is immersed in water (refractive index 4/3). A light beam incident normally on the face AB is totally reflected to reach on the face BC if.



A. $\sin\theta \geq \frac{8}{9}$

B. $\sin\theta \geq \frac{2}{3}$

C. $\sin\theta = \frac{\sqrt{3}}{2}$

D. $\frac{2}{3} < \sin\theta < \frac{8}{9}$

Answer:

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41. Find the power and type of the lens by which a person can see clearly the distant objects, if a person cannot see objects beyond $40cm$

A. $-2.5D$ and concave lens

B. $-2.5D$ convex lens

C. $-3.5D$ and concave lens

D. $-3.5D$ and convex lens

Answer:

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42. If the resolution limit of the eye is 1 minute and at a distance x km from the eye, two persons stands with a lateral separation of $3m$

, then calculate x for which the twok persons can be just resolved by the nacket eye.

A. $10km$

B. $15km$

C. $20km$

D. $30km$

Answer:

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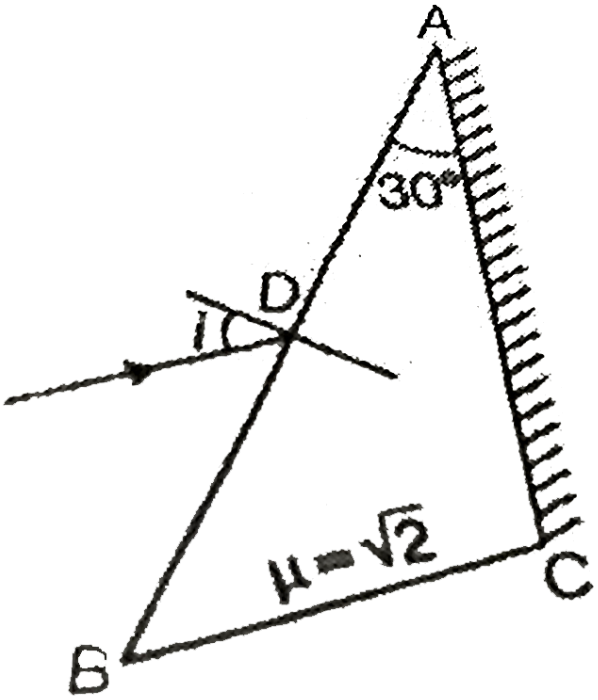
43. The prism shown in the figure has one side silvered. The angle of the prims is 30° and $\mu = \sqrt{2}$. What should be the angle of incidence, if the incidence ray retraces its initial path?



A. 50°

B. 45°

C. 60°

D. 75°

Answer:

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44. If a crown glass prims of refracing angle 10° have refractive indices for red and violet

rays 1.514 and 1.523 respectively then find the dispersion caused by a crown glass prism.

A. 0.07°

B. 0.08°

C. 0.09°

D. 0.10°

Answer:

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45. A thin prism of angle 6° made of glas of recfractive index 1.5 is combined with another prism made of glas of $\mu = 175$ to produce dispersion without deviation. The angel of second prism is

A. 7°

B. 4.67^2

C. 9°

D. 5°

Answer:

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46. A small object is enclosed in a sphere of solid glass $8cm$ in radius. It is situated $2cm$ from the centre and is viewed from the side of which it is nearer. Where will it appear to be if μ of glass $= 1.5/$

A. $6cm$ from the centre

B. $4cm$ from the nearer surface

C. $3\frac{1}{5}cm$ from the nearer surface

D. $3\frac{2}{3}cm$ from the centre

Answer:

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47. In a glass sphere, there is a small bubble $2 \times 10^{-2}m$ from its centre, if the bubble is viewed along a diameter of the sphere, from the side on which it lies, how far from the surface will it appear, the radius of glass

sphere is $5 \times 10^{-2} m$ and refractive index of glass is 1.5?

A. $2.5 \times 10^{-2} m$

B. $3.2 \times 10^{-2} m$

C. $6.5 \times 10^{-2} m$

D. $0.2 \times 10^{-2} m$

Answer:

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48. A ray incident at a point at an angle of incidence of 60° enters a glass sphere with refractive index $\sqrt{3}$ and it is reflected and refracted at the farther surface of the sphere. The angle between the reflected and refracted rays at this surface is:

A. 50°

B. 90°

C. 60°

D. 40°

Answer:

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49. The focal length of a thin convex lens for red and violet colour are $44.6cm$ and $42.5cm$. Calculate focal length for the mean colour and dispersive power of the lens.

A. Focal length $= 43.53cm$ dispersive power $= 0.048$

B. Focal length $= 28.53cm$ dispersive power $= 0.048$

C. Focal length $= 63.53cm,$ dispersvie power $= 8.48$

D. Foca length $= 30.43cm,$ dispersive power $= 4.8$

Answer:

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50. A wiere mesth consisting of very small squares is viewed at a distances of $8cm$ through a magnifying lens of fcoal length $10cm$, kept close to the eye. The magnification produced by the lens is

A. 5

B. 8

C. 10

D. 20

Answer:

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51. A double convex lens made of glass (refractive index $n = 1.5$) has the radii of curvature of both the surfaces as $20cm$. Incident light rays parallel to the axis of the lens will converge at a distance L such that

A. $L = 20cm$

B. $L = 10cm$

C. $L = 40cm$

D. $L = \frac{20}{3} cm$

Answer:

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52. An object appraches a convergent lens from the left of the lens with a uniform speed $5m/s$ and stops at the focus. The image

A. moves away from the lens with a uniform speed $5m/s$

B. moves away from the lens with a uniform acceleration

C. moves away from the lens with a non-uniform acceleration

D. moves towards the lens with a non-uniform acceleration

Answer:

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53. A concave lens and a convex lens have same focal length of $20cm$ and both put in contact this combination is used to view an object $5cm$ long kept at $20cm$ from the lens combination. As compared to object the image will be

A. magnifide and inverted

B. diminished and erect

C. of the same size and erect

D. of the same sizer and inverted

Answer:

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54. A source of light lies on the angle bisector of two plane mirrors inclined at angle θ. The value of θ, so that the light reflected from one mirror does not reach the other mirror will be.

A. $\theta \geq 120^\circ$

B. $\theta \geq 90^\circ$

C. $\theta \leq 120^\circ$

D. $\theta < 30^\circ$

Answer:

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55. On the axis of a spherical mirror of focal length f a short linear object of length L lies on the axis at a distance μ from the mirror. Its image has an axial length L' equal to

A. $L\left[\frac{f}{(\mu - f)}\right]^{1/2}$

B. $L\frac{(\mu+f)}{f}\Big]^{1/2}$

C. $L\left[\frac{(\mu-f)}{f}\right]^{2}$

D. $L\left[\frac{f}{(\mu-f)}\right]^{2}$

Answer:

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56. The radius of curvature of the face of plano-convex lens is $12cm$ and its refractive index is 1.5. If the plane surface of the lens is

now silvered, then find the focal length of the lens.

A. $26cm$

B. $22cm$

C. $24cm$

D. $2cm$

Answer:

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57. The speed at which the image of the luminous point object is moving, if the luminous point object is moving at speed v_0 towards a spherical mirror, along its axis is (Given, $R =$ radius of curvature $u =$ object distance)

A. $v_l = -v_o$

B. $v_l = -v_o\left[\frac{R}{2u-R}\right]^2$

C. $v_l = -v_o\left(\frac{2u-R}{R}\right)$

D. $v_l = -v_o\left(\frac{R}{2u-R}\right)$

Answer:

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58. A thin convergent glass lens $(\mu_g = 1.5)$ has a power of $+5.0D$. When this lens is immersed in a liquid of refractive index μ_1, it acts as a divergent lens of focal length $100cm$. The value of μ_1 is

A. $4/3$

B. $5/3$

C. $5/4$

D. $6/5$

Answer:

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59. Find the change in the focal lengthof the lens, if a convex lens of focal length $20cm$ and refractive index 1.5, is immersed in water having refractive index 1.33.

A. $62.2cm$

B. $5.82cm$

C. $58.2cm$

D. $6.22cm$

Answer:

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60. The reflective surface is given by $y = 2\sin x$. The reflective surface is facing positive axis. What is the least value of

coordinate of the point where a ray parallel to positive x-axis becomes parallel to positive y-axis after reflection?

A. $\left(\frac{\pi}{3}, \sqrt{3}\right)$

B. $\left(\frac{\pi}{2}, \sqrt{2}\right)$

C. $\left(\frac{\pi}{3}, \sqrt{2}\right)$

D. $\left(\frac{\pi}{4}, \sqrt{3}\right)$

Answer:

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61. An object is placed at the focus of convex mirror. The image will be at

A. c

B. f

C. infinity

D. none of these

Answer:

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62. A $4.5cm$ needle is placed $12cm$ away from a convex mirror of focal length $15cm$. Given the location of the image and the magniftication.

A. $6.7cm, 5/9$

B. $7.5cm, 5/9$

C. $6.7cm, 9/5$

D. $7.5cm, 9/5$

Answer:

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63. With a concave mirror, an object is placed at a distance x_1 from the principal focus, on the principal axis. The image is formed at a distance x_2 from the principal focus. The focal length of the mirror is

A. $x_1 x_2$

B. $\frac{x_1 + x_2}{2}$

C. $\sqrt{\frac{x_1}{x_2}}$

D. $\sqrt{x_1 x_2}$

Answer:

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64. An electromagnetic radiation of frequency v, wavelength λ, travelling with velocity c in air, enters a glass slab of refractive index μ. The frequency, wavelength and velocity of light in the glass slab will be respectively.

A. $\frac{n}{\mu}, \frac{\lambda}{\mu}, \frac{v}{\mu}$

B. $n, \frac{\lambda}{\mu}, \frac{v}{\mu}$

C. $n, \lambda, \frac{v}{\mu}$

D. $\frac{n}{\mu}, \frac{\lambda}{\mu}, v$

Answer:

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65. When a glass slab is placed on a cross made on a sheet, the cross appears to be raised by $1cm$. The thickness of the glass is $3cm$. The critical angle for glass is

A. $\sin^{-1}(0.33)$

B. $\sin^{-1}(0.5)$

C. $\sin^{-1}(0.67)$

D. $\sin^{-1}\left(\frac{\sqrt{3}}{2}\right)$

Answer:

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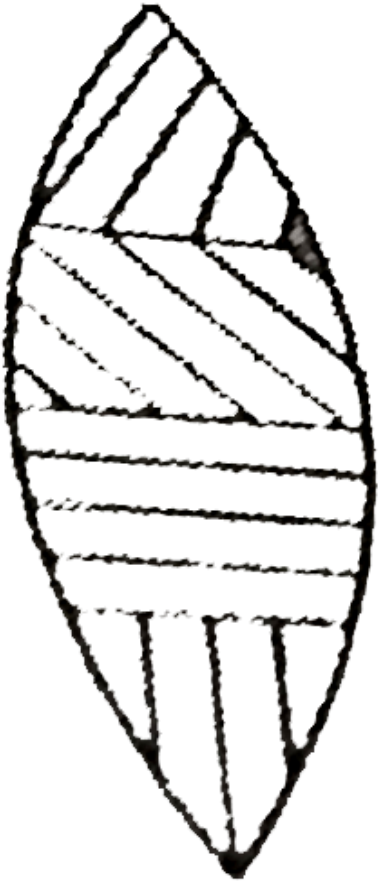
66. A layered lens is made of materials indicated by shades in the figure. The number

of images formed is



A. 1

B. 2

C. 3

D. 4

Answer:

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67. Resolving power of a telescope will be more, fi the diameter (a) of the objective is

A. larger

B. smaller

C. resolving poer does not depend on a

D. None of the above

Answer:

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68. A glass piece is dipped in a liquid of refractie index $4/3$, it gets dissappeared in the liquid. The refractive index of the glass piece is

A. $\frac{3}{4}$

B. $\frac{5}{3}$

C. $\frac{4}{5}$

D. $\frac{4}{3}$

Answer:

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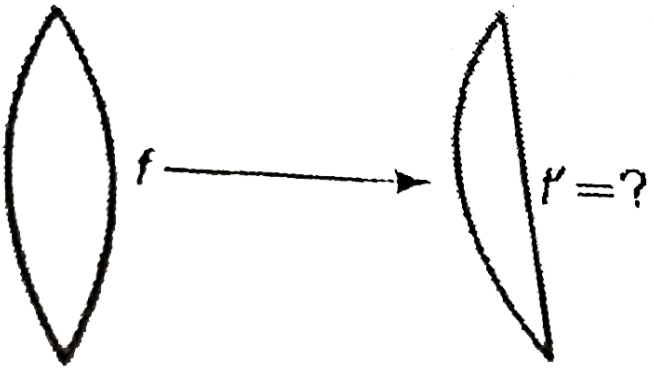
69. If the bio-convex lens is cut as shown in the figure, the new foacal length f' is



A. $2f$

B. f

C. $f/2$

D. infinite

Answer:

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70. Refractive index of a medium depends

A. on the medium only

B. on the incident light only

C. on both the conditions given in options a and b

D. None of the above

Answer:

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71. A point object is placed at the focus of a convex mirror, the image will be formed at

A. infinity

B. cente of curvature

C. at focus itself

D. none of these

Answer:

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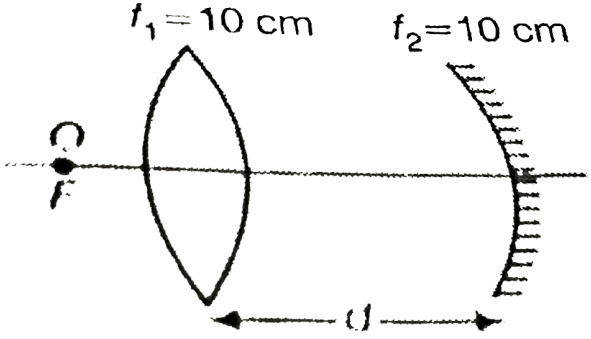

72.

A point object is placed at the focus of the bio-conved lens. What should be the value of X, so the final image forms at infinity?

A. $10cm$

B. $20cm$

C. $15cm$

D. none of these

Answer:

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73. The image formed by a concave spherical mirro

A. is always virtual

B. is always real

C. is always inverted

D. may be erect

Answer:

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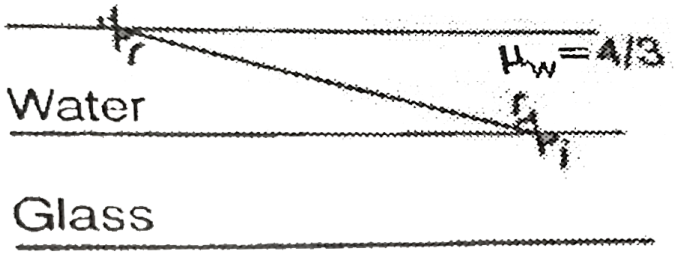
74. A ray of light is incident on the interface between water and glass at an angle i and refracted parallel to the water surface, then value of μ_g will be



A. $(4/3)\sin i$

B. $\frac{1}{\sin i}$

C. $\frac{4}{3}$

D. 1

Answer:

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75. In the Young's double slit experiment , a mica slip of thickness t and refractive index μ is introduced in the ray from first source S_1 .

By how much distance fringes pattern will be displaced ? (d = distance between the slits and D is the distance between slits and screen)

A. $\frac{d}{D}(\mu - 1)t$

B. $\frac{D}{d}(\mu - 1)t$

C. $\frac{d}{(\mu.1)D}$

D. $\frac{D}{d}(\mu - 1)$

Answer:

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76. The refractive index of water is $4/3$ and that of glas is $5/3$. What will be the critical angle for the ray of light entering water form the glass?

A. $\sin^{-1}\left(\frac{4}{5}\right)$

B. $\sin^{-1}\left(\frac{5}{4}\right)$

C. $\sin^{-1}\left(\frac{1}{2}\right)$

D. $\sin^{-1}\left(\frac{2}{1}\right)$

Answer:

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77. A film projector magnifies a $100cm^2$ film strip on a screen. If the linear magnification is 4, the area of the magnified film on the screen is

A. $1600cm^2$

B. $400cm^2$

C. $800cm^2$

D. $6400cm^2$

Answer: A

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78. A convex lens makes a real image 4 cm long on a screen. When the lens is shifted to a new position without disturbing the object, we again get a real image on the screen which is 16 cm tall. The length of the object must be

A. $\frac{1}{4}cm$

B. $8cm$

C. $12cm$

D. $20cm$

Answer:

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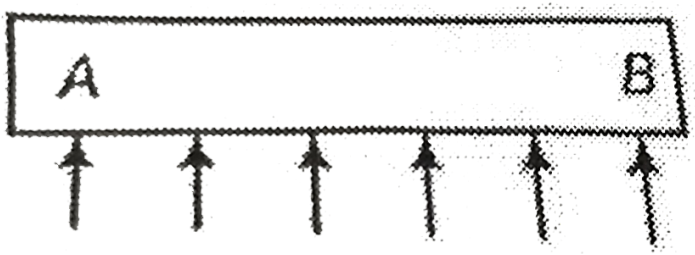
79. Rays of light fall on a glass slab $(\mu > 1)$ as shwon in figure. If μ at A is maximum and at B it is minimum, then what will happen to these

rays?



A. They will tilt towards A

B. They will tilt towards B

C. They will not deviate

D. There will be total internal reflection

Answer:

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80. The maximum value of index of refraction of a material of a prism which allows the passage of light through it when the refracting angle of prism is A is

A. $\sqrt{1+\sin\left(\frac{A}{2}\right)}$

B. $\sqrt{1+\cos\left(\frac{A}{2}\right)}$

C. $\sqrt{1+\tan^2\left(\frac{A}{2}\right)}$

D. $\sqrt{1+\cot^2\left(\frac{A}{2}\right)}$

Answer:

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81. The focal lengths of objective and the eyepiece of a compound microscope are f_o and f_e respectively. Then,

A. $f_o = f_e$

B. $f_o < f_e$

C. $f_o = f_e$

D. None

Answer: B

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82. The refractive index of a material of a plane-concave lens is $5/3$ the radius of curvature is $0.3m$. The focal length of the lens in air is

A. $-0.45m$

B. $-0.6m$

C. $-0.75m$

D. $-1.0m$

Answer:

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83. The optical path of a monochromatic light is same if it goes through $4.0cm$ of glass of $4.5cm$ of water. If the refractive index of glas is 1.53, the refractive index of the water is

A. 1.30

B. 1.36

C. 1.42

D. 1.46

Answer:

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84. What is the refractive index of a prism whose angle $A = 60^\circ$ and angle of minimum deviation$d_m = 30^\circ$?

A. $\sqrt{2}$

B. $\frac{1}{\sqrt{2}}$

C. 1

D. $\frac{1}{\sqrt{3}}$

Answer:

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85. An object is placed at a distance $20cm$ from the pole of a convex miror of focal length $20cm$. The image is produced a

A. $13.3cm$

B. $20cm$

C. $25cm$

D. $10cm$

Answer:

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86. The plano-convex lens of focal length $20cm$ and $30cm$ are placed together to form a double convex lens. The final length will be

A. $12cm$

B. $60cm$

C. $20cm$

D. $30cm$

Answer:

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87. Which mirror is to be used to obtain a paralel beam of light from a small lamp?

A. Plane mirror

B. Convex mirror

C. Concave mirror

D. Any one of these

Answer:

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88. Which of the following is a wrong statement?

A. $D = 1/f$, where f is the focal length and D is called the refractive power of a lens

B. Power is expressed ina diopter when f is in metres

C. Power is expressed in diopter and does not depend on the system of unit used top measure f

D. D is positive for convergent lens and negative for divergent lens

Answer:

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