# ©゙" doubtnut 

India's Number 1 Education App

## PHYSICS

## BOOKS - DISHA PHYSICS (HINGLISH)

## RAY OPTICS

Physics

1. A thin prism of angle $A=60^{\circ}$ produces a
deviation $d=30^{\circ}$. Find the refractive index of
the material of prism.


Screen

A. 1.5
B. 1.0
C. 2.5
D. 0.5

## Answer:

## - Watch Video Solution

2. A ray of light is incident at an angle of $60^{\circ}$
on the face of a prism having refracting angle
$30^{\circ}$. The ray emerging out of the prism makes an angle $30^{\circ}$ with the incident ray.

Show that the emergent ray is perpendicular to the face through which it emerges and calculate the refractive index of the material of prism.
A. 1
B. $\sqrt{2}$
C. $\sqrt{3}$
D. 2

## Answer:

3. Light of wavelength $6000 \AA$ enters from air into water (a medium of refractive index $4 / 3$ ).

Find the speed and wavelength $[\mathrm{c}=3 \times 108 \mathrm{~m} / \mathrm{s}$

> A. $2.25 \times 10^{8} \mathrm{~m} / \mathrm{s}, 4500 \AA$
> B. $1.25 \times 10^{8} \mathrm{~m} / \mathrm{s}, 2500 \AA$
> C. $3.15 \times 10^{8} \mathrm{~m} / \mathrm{s}, 3500 \AA$
> D. $3.15 \times 10^{8} \mathrm{~m} / \mathrm{s}, 5500 \AA$

## Answer:

## D Watch Video Solution

4. A ray of light falls on a glass plate of refractive index $\mu=1.5$.

What is the angle of incidence of the ray if the angle between the reflected and refracted rays is $90^{\circ}$ ?
A. $30^{\circ}$

> B. $\sin ^{-1}\left(\frac{2}{3}\right)$
> C. $\tan ^{-1}\left(\frac{2}{3}\right)$
> D. $\tan ^{-1}\left(\frac{3}{2}\right)$

## Answer:

## - Watch Video Solution

5. An optical fibre consists of core of $\mu_{1}$ surrounded by a cladding of $\mu_{2}<\mu_{1}$. A beam of light enters from air at an angle $\alpha$ with axis of fibre. The highest $\alpha$ for which ray can be travelled through fibre is

A. $\cos ^{-1} \sqrt{\mu_{2}^{2}-\mu_{1}^{2}}$
B. $\sin ^{-1} \sqrt{\mu_{1}^{2}-\mu_{2}^{2}}$
C. $\tan ^{-1} \sqrt{\mu_{1}^{2}-\mu_{2}^{2}}$
D. $\sec ^{-1} \sqrt{\mu_{1}^{2}-\mu_{2}^{2}}$

Answer:

## D Watch Video Solution

6. A glass plate 4 mm thick is viewed from the above through a microscope. The microscope must be lowered 2.58 mm as the operator
shifts from viewing the top surface to viewing
the bottom surface through the glass. What is the index of refraction of the glass?
A. 1.61
B. 1.55
C. 3.24
D. 1.21

Answer:

D Watch Video Solution
7. A vertical microscope is focussed on a point
at the bottom of an empty tank. Water (
$\mu=4 / 3)$ is then poured into the tank. The
height of the water column is 4 cm . Another
lighter liquid, which does not mix with water and which has refractive index $3 / 2$ is then poured over the water.The height of liquid column is 2 cm . What is the vertical distance through which the microscope must be moved to bring the object in focus again ?
A. 2.61 m

## B. 1.55 m

C. 3.12 m
D. 1.67 m

## Answer:

## - Watch Video Solution

8. Light from a sodium lamp $\left(\lambda_{0}=589 n m\right)$ passes through a tank of glycerin (refractive index $=1.47) 20 \mathrm{~m}$ long in a time $t_{1}$. If it takes a time $t_{2}$ to transverse the same tank
when filled with carbon disulfide (index $=1.63$
), determine the difference $t_{2}-t_{1}$.
A. $6.67 \times 10^{-8} \mathrm{sec}$
B. $1.07 \times 10^{-7} \mathrm{sec}$
C. $2.07 \times 10^{-7} \mathrm{sec}$
D. $1.07 \times 10^{-8} \mathrm{sec}$

Answer:
( Watch Video Solution
9. A light beam is traveling from Region I to
region IV (refer figure). The refractive indices
in Region I, II, III, and IV are
$n_{0}, n_{0} / 2, n_{0} / 6$ and $n_{0} / 8$, respectively. The
angle of incidence $\theta$ for which the beam just
misses entering Region IV is

$$
\begin{aligned}
& \text { A. } \sin ^{-}\left(\frac{3}{4}\right)
\end{aligned}
$$

B. $\sin ^{-}\left(\frac{1}{8}\right)$
C. $\sin ^{-}\left(\frac{1}{4}\right)$
D. $\sin ^{-}\left(\frac{1}{3}\right)$

## Answer:

## D Watch Video Solution

10. The refractive index of the material of a prism is $\sqrt{2}$ and its prism angle is $30^{\circ}$ One of its refracting faces is polished .The incident
beam of light will return back for the angle of incidence
A. $60^{\circ}$
B. $45^{\circ}$
C. $30^{\circ}$
D. $0^{\circ}$

Answer:
( Watch Video Solution
11. When light rays are incident on a prism at an angle of $45^{\circ}$, the minimum deviation is obtained. If refractive index of the material of prism is $\sqrt{2}$, then the angle of prism will be

## - Watch Video Solution

12. A glass prism of refractive index 1.5 and angle of prism $6^{\circ}$ is put in contact with another prism of refractive index 1.6 when a ray of light is made incident on this
combination normally then it emerges out undeviated. The angle of second prism will be
A. $6^{\circ}$
B. $5^{\circ}$
C. $4^{\circ}$
D. $3^{\circ}$

Answer:

D Watch Video Solution
13. Calculate the dispersive power for crown
glass from the given data
$\mu_{v}=1.523$ and $\mu_{r}=1.5145$.
A. 0.0163
B. 0.0183
C. 0.0142
D. 0.0112

Answer:

D Watch Video Solution
14. Calculate the angle of a prism of dispersive power 0.021 and refractive index 1.53 to form an achromatic combination with prism of angle $4.2^{\circ}$, and dispersive power 0.045 , having refractive index 1.65. Find also the net deviation.
A. $1.12^{\circ}$
B. $2.16^{\circ}$
C. $3.12^{\circ}$
D. $4.18^{\circ}$

## Answer:

## D Watch Video Solution

15. A ray of light falls on a normally on a
refracting face of a prism. Find the angle of
prism if the ray just fails to emerge from the
prism ( $\mu=3 / 2$ ).
A. $55^{\circ}$
B. $22^{\circ}$
C. $12^{\circ}$

## D. $42^{\circ}$

## Answer:

## D Watch Video Solution

16. The refractive indices of material of a prism
for blue and red colours are 1.532 and 1.514
respectively. Calculate angular dispersion produced by the prism if angle of prism is $8^{\circ}$
A. $0.144^{\circ}$
B. $0.122^{\circ}$
C. $0.133^{\circ}$
D. $0.111^{\circ}$

## Answer:

## D Watch Video Solution

17. A ball is dropped from a height of 20 m above the surface of water in a lake. The refractive index of water is 4.3. A fish inside the
lake, in the line of fall of the ball, is looking at
the ball. At an instant, when the ball is 12.8 m
above the water surface, the fish sees the speed of the ball as $\left[\right.$ Take $_{g}=10 \frac{\mathrm{~m}}{\mathrm{~s}^{2}}$. $]$
A. $9 \mathrm{~m} / \mathrm{s}$
B. $12 \mathrm{~m} / \mathrm{s}$
C. $16 \mathrm{~m} / \mathrm{s}$
D. $21.33 \mathrm{~m} / \mathrm{s}$

Answer: C

D Watch Video Solution
18. A glass prism of refractive index 1.5 is immersed in water (refractive index 4/3). A
light beam incident normally on the face $A B$ is totally reflected to reach on the face BC if.

A. $\sin \theta \geq 8 / 9$
B. $2 / 3<\sin \theta<8 / 9$
C. $\sin \theta \leq 2 / 3$

## D. It is not possible

## Answer:

## D Watch Video Solution

19. A prism having an apex angle of $4^{\circ}$ and refractive index of 1.50 is located in front of a
vertical plane mirror as shown in the figure. A horizontal ray of light is incident on the prism.

The total angle through which the ray is

## deviated is:


A. $176^{\circ}$
B. $4^{\circ}$
C. $178^{\circ}$
D. $2^{\circ}$

## Answer:

## D Watch Video Solution

20. Let the $x-z$ plane be the boundary between two transparent media. Medium 1 in $z \geq 0$ has
a refractive index of $\sqrt{2}$ and medium 2 with
$z<0$ has a refractive index of $\sqrt{3}$. A ray of
light in medium 1 given by the vector $\vec{A}=6 \sqrt{3} \hat{i}+8 \sqrt{3} \hat{j}-10 \hat{k}$ is incident on the
plane of separation. The angle of refraction in medium 2 is:
A. The speed of light in the medium y is $\sqrt{3}$
times than in medium $x$
B. The speed of light in the medum $y$ is
$\frac{1}{\sqrt{3}}$ times than in medium $x$.
C. The total internal reflection can take
place when the incidence is in $x$
D. The total internal reflection can take
place when the incidence is in $y$

## Answer:

## D Watch Video Solution

21. Dispersive power does not depend upon
A. The shape of prism
B. Angle of prism
C. Height of the prism
D. Material of prism

## - Watch Video Solution

22. Assertion : There is no dispersion of light refracted through a rectangular glass slab.

Reason : Dispersion of light is the phenomenon of splitting of a beam of white light into its constituent colours.
A. Statement-1 is True, Statement-2 is True,

Statement-2 is a correct explanation for

Statement-1
B. Statement-1 is True, Statement-2 is True,

Statement-2 is NOT a correct explanation
for Statement-1.
C. Statement-1 is False, Statement-2 is True.
D. Statement-1 is True, Statement-2 is False.

## Answer:

## D Watch Video Solution

23. Assertion : Dispersion of light occurs because velocity of light in a material depends upon its colour.

Reason : The dispersive power depends only
upon the material of the prism, not upon the refracting angle of the prism
A. Statement-1 is True, Statement-2 is True,

Statement-2 is a correct explanation for

Statement-1
B. Statement-1 is True, Statement-2 is True,

Statement-2 is NOT a correct explanation
for Statement-1.
C. Statement-1 is False, Statement-2 is True.
D. Statement-1 is True, Statement-2 is False.

## Answer:

## D Watch Video Solution

24. A glass slab is placed over a page in which letters are printed in different colours. Will the image of all the letters lie in the same plane ?
A. Statement-1 is True, Statement-2 is True,

Statement-2 is a correct explanation for

Statement-1

B. Statement-1 is True, Statement-2 is True,

Statement-2 is NOT a correct explanation
for Statement-1.
C. Statement-1 is False, Statement-2 is True.

## D. Statement-1 is True, Statement-2 is False.

## Answer:

## D Watch Video Solution

## 25. Find the number of images formed by two

 mutually perpendicular mirrors.A. 3
B. 4
C. 1
D. 2

## Answer:

## D Watch Video Solution

26. The angle $q$ between two plane mirrors producing five images of a given object is given by.

$$
\text { A. } 30^{\circ} \leq 0 \leq 72^{\circ}
$$

$$
\text { B. } 45^{\circ} \leq 0 \leq 72^{\circ}
$$

C. $60^{\circ} \leq 0 \leq 72^{\circ}$

$$
\text { D. } 15^{\circ} \leq 0 \leq 72^{\circ}
$$

## Answer:

## D Watch Video Solution

27. Two plane mirrors are inclined at angle $\theta$.A
ray of light is incident on one mirror at an
angle of incidence.i.The ray is reflected from
this mirror,falls on the second mirror from where it is reflected parallel to the first mirror

What is the value of $i$,the angle of incident in
term of $\theta$ ?
A. $20-90^{\circ}$
B. $40-90^{\circ}$
C. $0-90(\circ)$
D. 30-90^(@)

Answer:

D Watch Video Solution
28. A girl stands at a distance 30 cm from the mirror. She is able to see her erect image but of $1 / 5$ height of actual height. The mirror will be :
A. plane mirror
B. concave mirror
C. convex mirror
D. plane convex mirror

## Answer:

29. An object is placed in front of a convex mirror at a distance of 50 cm . A plane mirror is introduced covering the lower half of the convex mirror. If the distance between the object and the plane mirror is 30 cm , it is
found that there is no parallax between the images formed by the two mirrors. What is the radius of curvature of the convex mirror?
A. 50 cm
B. 25 cm

## C. 12.5 cm

## D. ) 100 cm

## Answer:

## D Watch Video Solution

30. Two plane mirror are inclined at an angle of $30^{\circ}$. Then the first four images of an object $O$ placed between the two mirrors are correctly represented by
A.
(a)

B.
(b)

C.

D.
(d)


## Answer:

## - Watch Video Solution

31．The plane of a mirror makes an angle of 30 with horizontal．If a vertical ray is incident on a mirror，then what is the angle between mirror and reflected ray？

A． 60 。

B． 90 。

C． 45 。

D． 30 。

## Answer：

32. Two plane mirrors are placed at an angle $\theta$ so that a ray parallel to one mirror gets reflected parallel to second mirror after two consecutive reflections. The value of $\theta$ will be-
A. $30^{\circ}$
B. $60^{\circ}$
C. $75^{\circ}$
D. $90^{\circ}$

## Answer:

## - Watch Video Solution

33. A 0.2 cm high object is placed 15 cm from a concave mirror of focal length 5 cm . Find position and size of the image.
A. $7.5 \mathrm{~cm}, 0.1 \mathrm{~cm}$.
B. $7.5 \mathrm{~cm}, 0.4 \mathrm{~cm}$.
C. $10.0 \mathrm{~cm}, 0.5 \mathrm{~cm}$.
D. $7.5 \mathrm{~cm}, 0.4 \mathrm{~cm}$.

## Answer:

## D Watch Video Solution

34. A 0.5 cm high object is placed at 30 cm
from a convex mirror whose focal length is 20
cm . Find the position and size of the image.
A. $12 \mathrm{~cm}, 0.2 \mathrm{~cm}$
B. $18 \mathrm{~cm}, 0.2 \mathrm{~cm}$
C. $6 \mathrm{~cm}, 0.5 \mathrm{~cm}$
D. $5 \mathrm{~cm}, 0.1 \mathrm{~cm}$

## Answer:

## D Watch Video Solution

35. There is a convex mirror of radius 50 cm .

The image of a point at a distance 50 cm from
the pole of mirror on its axis will be formed at

A. infinity
B. pole
C. focus
D. 16.67 cm behind the mirror

## Answer:

## D Watch Video Solution

36. A particle is moving at a constant speed $V$ from a large distance towards a concave mirror of radius R along its principal axis. Find
the speed of the image formed by the mirror as a function of the distance $x$ of the particle from the mirror.
A. $\left(\frac{R}{2 u-R}\right)^{2} \cdot v_{0}$
B. $\left(\frac{R}{2 u-R}\right)^{2} \cdot v_{0}$
C. $\left(\frac{2 R}{2 u-R}\right)^{2} \cdot v_{0}$
D. None of these

Answer:

## D Watch Video Solution

37. A short linear object of length b lies along the axis of a concave mirror of focal length $f$ at a distanee $u$ from the pole of the mirror. The size of the image is approximately equal to
A. $b\left(\frac{f}{u-f}\right)^{2}$
B. $b\left(\frac{f}{u+f}\right)^{2}$
C. $b\left(\frac{2 f}{u-f}\right)^{2}$
D. None of these

## Answer:

38. The relation between the linear magification $m$, the object distance $u$ and the focal length $f$ is

$$
\begin{aligned}
& \text { A. } m=\frac{f-u}{f} \\
& \text { B. } m=\frac{f}{f-u} \\
& \text { C. } m=\frac{f+u}{f} \\
& \text { D. } m=\frac{f}{f+u}
\end{aligned}
$$

Answer:
39. An object of length 1 cm is placed at a distance of 15 cm from a concave mirror of focal length 10 cm . The nature and size of the image are
A. real, inverted, 1.0 cm
B. real, inverted, 2.0 cm
C. virtual, erect, 0.5 cm
D. virtual, erect, 1.0 cm

## Answer:

## D Watch Video Solution

40. In an experiment to determine the focal
length $(f)$ of a concave mirror by the $u-v$ method, a student places the object pin A on the principal axis at a distance x from the pole
P. The student looks at the pin and its inverted image from a distance keeping his/her eye in
line with PA. When the student shifts his/her
eye towards left, the image appears to the right of the object pin. Then,
A. $\times<f$
B. $f<\times<2 f$
C. $\times=2 f$
D. $\times>2 f$

Answer:
( Watch Video Solution
41. Two plans mirrors are inclined to each other at some angle .A ray of light incident at $30^{\circ}$ on one,after reflection form the other retraces its path .The angles between the mirrors is:
$30^{\circ}(2) 45^{\circ}(3) 60^{\circ}(4) 90^{\circ}$
A. $30^{\circ}$
B. $45^{\circ}$
C. $60^{\circ}$
D. $90^{\circ}$

## Answer:

## D Watch Video Solution

42. 9A convex mirror is used to form the image of an object. Which of the following
statements is wrong ?
A. The image lies between the pole and the
focus
B. The image is diminished in size
C. The image is erect

## D. The image is real

## Answer:

## D Watch Video Solution

43. A point source of light $B$ is placed at a
distance $L$ in front of the centre of a mirror of
width $d$ hung vertically on a wall. A man walks
in front of the mirror along a line parallel to
the mirror at a distance 2 L from it as shown in
fig. The greatest distance over which he can
see the image of the light source in the mirror is

$$
\underset{\sim}{\text { d }}
$$

A. $d / 2$
B. d
C. 2d
D. 3d

## Answer:

## D Watch Video Solution

44. A concave mirror of focal length $f$ produces a real image $n$ times the size of the object. What is the distance of the object from the mirror?

$$
\begin{aligned}
& \text { A. } \frac{-(n+1)}{n} f_{0} \\
& \text { B. } \frac{(n+1)}{n} f_{0} \\
& \text { C. } \frac{(n-1)}{n} f_{0}
\end{aligned}
$$

D. $\frac{-\left(n^{2}+1\right)}{n} f_{0}$

## Answer:

## D Watch Video Solution

45. The focal length of a concave mirror is 30
cm.Find the position of the object in front of
the mirror,so that the image is there times the size of the objects.

A. 20 cm (only)

B. 40 cm (only)
C. 30 cm (only)
D. 20 cm or 40 cm

## Answer:

## - Watch Video Solution

46. A plane mirror reflecting a ray of incident
light is rotated through an angle $q$ about an
axis through the point of incidence in the plane of the mirror perpendicular to the plane
of incidence, then
(1) The reflected ray rotates through an angle
$2 q$
(2) The incident ray is fixed
(3) The reflected ray does not rotate
(4) The reflected ray rotates through an angle q
A. 1, 2 and 3 are correct
B. 1 and 2 are correct
C. 2 and 4 are correct
D. 1 and 3 are correct

## Answer:

## D Watch Video Solution

47. The light reflected by a plane mirror will not form a real image
(1) If the rays incident on the mirror are diverging
(2) Under no circumstances
(3) If the object is real
(4) If the rays incident on the mirror are converging
A. 1, 2 and 3 are correct
B. 1 and 2 are correct
C. 2 and 4 are correct
D. 1 and 3 are correct

Answer: A

D Watch Video Solution
48. Which of the following form(s) a virtual and erect image for all positions of the object?
(1) Convex lens
(2) Concave lens
(3) Convex mirror
(4) Concave mirror
A. 1, 2 and 3 are correct
B. 1 and 2 are correct
C. 2 and 4 are correct
D. 1 and 3 are correct

Answer:

D Watch Video Solution
49. A plane mirror $\left(M_{1}\right)$ and a concave mirror
$\left(M_{2}\right)$ of focal length 10 cm are arranged as
shown in figure. An object is kept at origin.

Answers the following questions. (consider image formed by single reflection in all cases).


If concave mirror is replaced by convex mirror
of same focal length then coordinates of image formed by $\left(M_{2}\right)$ will be
A. $(-20 \mathrm{~cm}, 0)$
B. $(10 \mathrm{~cm},-60 \mathrm{~cm})$
C. $(10 \mathrm{~cm},-10 \mathrm{~cm})$
D. $(10 \mathrm{~cm}, 10 \mathrm{~cm})$

Answer:

- Watch Video Solution

50. A plane mirror $\left(M_{1}\right)$ and a concave mirror
$\left(M_{2}\right)$ of focal length 10 cm are arranged as
shown in figure. An object is kept at origin.
Answers the following questions. (consider image formed by single reflection in all cases).


If concave mirror is replaced by convex mirror
of same focal length then coordinates of image formed by $\left(M_{2}\right)$ will be
A. ( $10 \mathrm{~cm},-40 \mathrm{~cm}$ )
B. $(10 \mathrm{~cm},-60 \mathrm{~cm})$
C. $(10 \mathrm{~cm}, 8 \mathrm{~cm})$
D. None of these

Answer:
( Watch Video Solution
51. Assertion : The mirrorrs used in search
lights are parabolic and not concave spherical.
Reason : In a concave spherical mirrorr the image formed is always virtual.
A. Statement-2: Small mirror always forms a
virtual image.

B. Statement-1 is True, Statement-2 is True,

Statement-2 is NOT a correct explanation
for Statement-1.
C. Statement -1 is False, Statement-2 is

True.
D. Statement -1 is True, Statement-2 is

False.

## Answer:

## D Watch Video Solution

52. Assertion: When an objecct is placed between two plane parallel mirrorrs, then all
the images found are of equal intensity.

Reason: In case of plane parallel mirrorrs, only two images are possible.
A. Statement-2: Small mirror always forms a virtual image.
B. Statement-1 is True, Statement-2 is True,

Statement-2 is NOT a correct explanation
for Statement-1.
C. Statement -1 is False, Statement-2 is

True.

# D. Statement -1 is True, Statement-2 is 

 False.
## Answer:

## D Watch Video Solution

53. Assertion : The size of the mirrorr affect
the nature of the image.

Reason : Small mirrorrs always forms a virtual image.
A. Statement-2: Small mirror always forms a virtual image.
B. Statement-1 is True, Statement-2 is True,

Statement-2 is NOT a correct explanation
for Statement-1.
C. Statement -1 is False, Statement-2 is

True.
D. Statement -1 is True, Statement-2 is

False.

## - Watch Video Solution

54. A small point object is placed atOat a distance of 0.60 meter in air from a convex spherical surface of refractive index1.5.If the radius of the curvature is 25 cm then what is the position of the image on the principal axis.
A. 4.5 m
B. 2.5 m
C. 1.5 m

## Answer:

## D Watch Video Solution

55. The radius of a glass ball is 5 cm . There is an air bubble at 1 cm from the centre of the ball and refractive index of glass is 1.5 . The position of image viewed from surface near the bubble is.
A. 3.63 cm
B. 4.63 cm
C. 2.12 cm
D. 5.12 cm

## Answer:

## - Watch Video Solution

56. In case of thin lens of focal length $f$ an object is placed at a distance $x_{1}$ from first
focus and its image is formed at a distance $x_{2}$
from the second focus, find $x_{1} x_{2}$
A. f
B. $f^{3}$
C. $f^{2}$
D. $1 / f$

## Answer:

## D Watch Video Solution

57. What is the refractive index of material of a plano-convex lens, if the radius of curvature of
the convex surface is 10 cm and focal length of
the lens is 30 cm ?
A. $1 / 3$
B. $4 / 3$
C. $2 / 3$
D. $1 / 4$

Answer:
( Watch Video Solution
58. A convex lens of focal length 10.0 cm is
placed in contact with a convex lens of 15.0 cm
focal length. What is the focal length of the combination ?
A. 6 cm
B. 12 cm
C. 8 cm
D. 4 cm

Answer:
59. A 20 cm convex lens is placed in contact with a diverting lens of unknown focal length
,The lens combination acts as a converging lens and has a length of 30 cm . What is the focal length of the diverging lens.
A. -10 cm
B. -30 cm
C. -60 cm
D. -90 cm

## Answer:

## D Watch Video Solution

60. A pin is placed 10 cm in front of a convex
lens of focal length 20 cm , made of a material
having refractive index 1.5 . The surface of lens
farther away from the pin is silvered and has a
radius of curvature 22 cm . Determine the position of the final image. Is the image real or

## virtual?


A. 11 cm in front
B. 21 cm in front
C. 15 cm in front
D. 31 cm in front

## Answer:

## D Watch Video Solution

61. A converging lens is used to form an image on a screen. When the upper half of the lens is
covered by an opaque screen,
A. half image is formed
B. full image is formed
C. intensity of image will be enhanced
D. None of these

## Answer:

## D Watch Video Solution

62. A convex lens is made of a material having
refractive index 1.2. Both the surface of the
lens are convex. If it is dipped into water
( $\mu=1.33$ ) it will behave lidk
A. convergent
B. divergent lens
C. plane glass plate

## D. like a prism

## Answer:

## D Watch Video Solution

63. An equiconvex lens is made from glass of
refractive index 1.5. If the radius of each
surface is changed from 5 cm to 6 cm , then the
power
A. 20 cm

## B. 10 cm

C. 5 cm
D. zero

## Answer:

## D Watch Video Solution

64. A convex lens when placed in the first position forms a real image of an object on a fixed screen. The distance between the object and the screen is 75 cm . On displacing the lens
from first position by 25 cm to the second position, again a real image is formed on the screen. Then the focal length of the lens is


First position Second position
A. 25.0 cm
B. 16.7 cm
C. 50.3 cm
D. 33.3 cm

## Answer:

## D Watch Video Solution

65. A lens if placed between a source of light
and a wall. It forms images of area $A_{1}$ and $A_{2}$
on the wall for its two different positions. The area of the source or light is
A. $\frac{A_{1}+A_{2}}{2}$
B. $\left[\frac{1}{A_{1}}+\frac{1}{A_{2}}\right]^{-1}$
C. $\sqrt{A_{1} A_{2}}$
D. $\left[\frac{\sqrt{A}_{1}+\sqrt{A}_{2}}{2}\right]^{2}$

## Answer:

## D Watch Video Solution

66. A convex lens of power $4 D$ is kept in contact with a concave lens of power 3D, the effective power of combination will be
A. 7 D
B. $4 D / 3$
C. $1 D$
D. $3 D / 4$

## Answer:

## D Watch Video Solution

67. The power of a plano-convex lens is P. If this
lens is cut longitudinally along its principal axis into two equal parts and then they are joined as given in the figure. The power of

A. $P$
B. 2 P
C. $P / 2$
D. zero

Answer:

## - Watch Video Solution

68. The plane surface of a planoconvex lens is
silvered. If radius of curved surface is $R$ and refractive index is $\mu$, then the system behaves
like a concave mirror whose radius will be

$$
\text { A. } \frac{R}{\mu}
$$

B. $R \mu$
C. $\frac{R}{\mu-1}$
D. $R(\mu-1)$

## Answer:

## - Watch Video Solution

69. Calculate the maximum magnifying power of a simple microscope consisting of a convex
lens of focal length 5 cm . Distance of distinct vision is 25 cm .
A. 20 D
B. 10 D
C. $5 D$

D. 15 D

## Answer:

## D Watch Video Solution

70. In a compound microscope, the objective and eye piece have focal lengths
0.95 cm and 5 cm respectively, and are kept at a distance of 20 cm . The final image is formed at a distance of 25 cm from the eye piece.

Calculate the position of the object and the total magnification.
A. 94
B. 84
C. 75
D. 88

Answer:
( Watch Video Solution
71. Resolving power of a microscope doesn't depend upon
(1) Velocity of light used
(2) Frequency of light used
(3) Focal length of objective
(4) Wavelength of light used
A. 1,2 and 3 are correct
B. 2 and 2 are correct
C. 3 and 4 are correct
D. 2 and 3 are correct

## Answer:

## D Watch Video Solution

72. Assertion : A double convex lens
( $\mu=1.5$ ) has focal length 10 cm . When the
lens is immersed in water $(\mu=4 / 3)$ its focal length becomes 40 cm .

Reason : $\frac{1}{f}=\frac{\mu_{1}-\mu_{m}}{\mu_{m}}\left(\frac{1}{R_{1}}-\frac{1}{R_{2}}\right)$
A. Statement-1 is True, Statement-2 is True,

Statement-2 is a correct explanation for

Statement-1.
B. Statement-1 is True, Statement-2 is True,

Statement-2 is NOT a correct explanation
for Statement-1.
C. Statement -1 is False, Statement-2 is

True.
D. Statement -1 is True, Statement-2 is

False.

## Answer:

73. Assertion : The focal length of the lens does not change when red light is replaced by blue light.

Reason: The focal length of lens does not depends on colour of light used.
A. Statement-1 is True, Statement-2 is True,

Statement-2 is a correct explanation for

Statement-1.
B. Statement-1 is True, Statement-2 is True,

Statement-2 is NOT a correct explanation
for Statement-1.
C. Statement -1 is False, Statement-2 is

True.
D. Statement -1 is True, Statement-2 is

False.

## Answer:

74. Assertion : By increasing the diameter of the objective of telescope, we can increase its range.

Reason : The range of a telescope tells us
how far away a star of some standard brightness can be spotted by telescope.
A. Statement-1 is True, Statement-2 is True,

Statement-2 is a correct explanation for

Statement-1.
B. Statement-1 is True, Statement-2 is True,

Statement-2 is NOT a correct explanation
for Statement-1.
C. Statement -1 is False, Statement-2 is

True.
D. Statement -1 is True, Statement-2 is

False.

## Answer:

$\square$

