03 Dec 2024 Live Classes Schedule

| 8:00AM | 03 DEC 2024 DAILY CURRENT AFFAIRS | RUBY MA'AM |
| 9:00AM | 03 DEC 2024 DAILY DEFENCE UPDATES | DIVYANSHU SIR |

SSB INTERVIEW LIVE CLASSES

| 9:30AM | ONLINE COURSE INTRO | ANURADHA MA'AM |

NDA 1 2025 LIVE CLASSES

1:00PM	PHYSICS - REFRACTION OF LIGHT - CLASS 2	NAVJYOTI SIR
4:30PM	ENGLISH - ADAPTATION OF BORROWED WORDS - CLASS 1	ANURADHA MA'AM
5:30PM	MATHS - LIMITS & CONTINUITY - CLASS 4	NAVJYOTI SIR

CDS 1 2025 LIVE CLASSES

1:00PM	PHYSICS - REFRACTION OF LIGHT - CLASS 2	NAVJYOTI SIR
4:30PM	ENGLISH - ADAPTATION OF BORROWED WORDS - CLASS 1	ANURADHA MA'AM
7:00PM	MATHS - TRIGONOMETRY - CLASS 5	NAVJYOTI SIR

SSBCrack
EXAMS

CALL US: 080-69185400

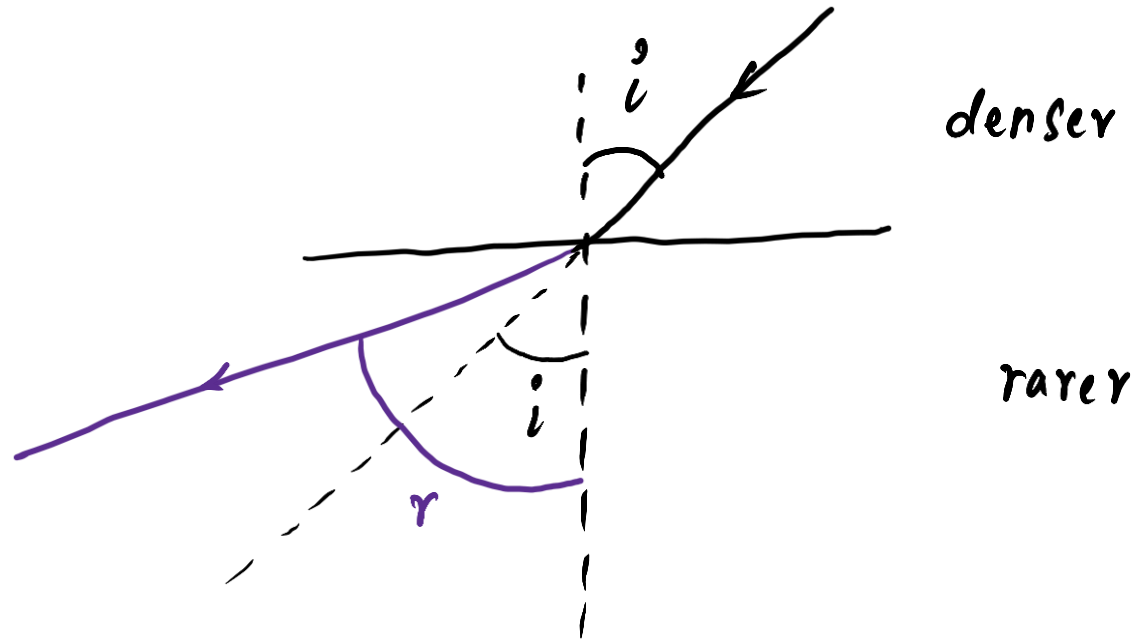GET IT ON Google Play | DOWNLOAD THE APP NOW
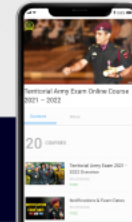
LIGHT – REFRACTION – PRACTISE MCQs

When A Light Ray Passes From A Denser Medium To A Rarer Medium , Which Angle Is Greater ?

A. Angle Of Incidence

B. Angle Of Refraction ✓

C. Both

D. None Of The Above

denser

rarer

When A Light Ray Passes From A Denser Medium To A Rarer Medium , Which Angle Is Greater ?

A. Angle Of Incidence

B. **Angle Of Refraction**

C. Both

D. None Of The Above

The Power Of A Lens Is - 4.0 D. Which Lens Is It ?

A. Convex

B. Concave ✓

C. Both

D. None Of The Above

$$P = \frac{1}{f}$$

$$P = -ve \Rightarrow f = -ve$$

Concave lens

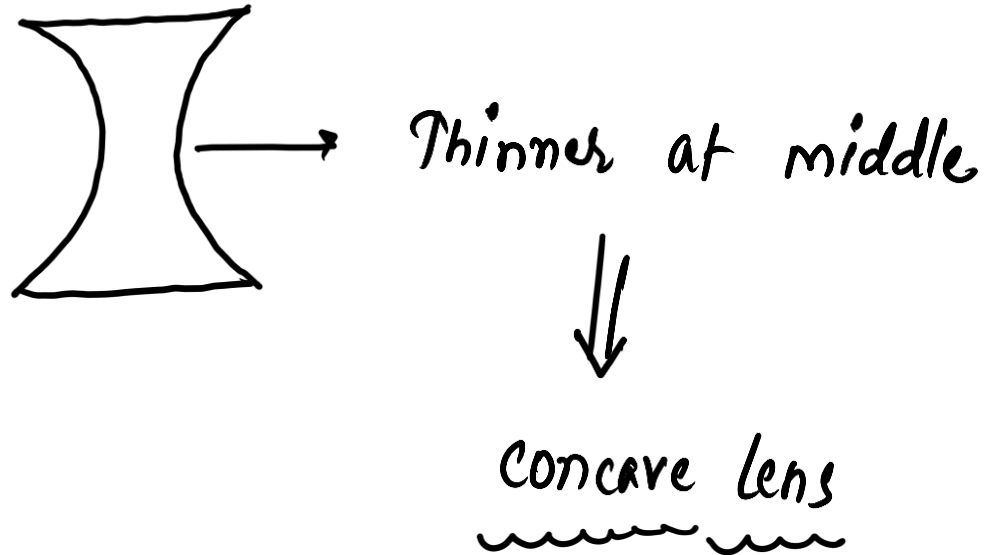**The Power Of A Lens Is -4.0 D. Which Lens Is It ?**

A. Convex

B. Concave

C. Both

D. None Of The Above

A Lens That Is Thinner At The Middle Than Edges Is

A. Concave

B. Convex

C. Plano-concave

D. Plano-convex

Thinner at middle

⇓

Concave lens

A Lens That Is Thinner At The Middle Than Edges Is

A. Concave

B. Convex

C. Plano-concave

D. Plano-convex

Formula To Find The Refractive Index Of A Medium Is

A. n = Speed Of Light In Medium / Speed Of Light In Air

B. n = 1 / Speed Of Light In Medium

C. n = Speed Of Light In Air / Speed Of Light In Medium ✓

D. n = 1 / Speed Of Light In Air

$$n = \frac{\text{speed of light in air}}{\text{"} \quad \text{"} \quad \text{"} \quad \text{"} \quad \text{medium}}$$

Formula To Find The Refractive Index Of A Medium Is
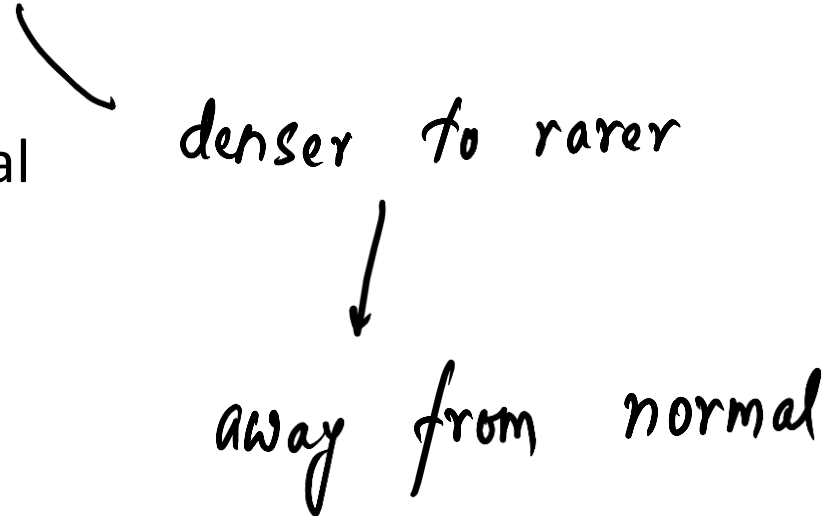
A.   n = Speed Of Light In Medium / Speed Of Light In Air

B.   n = 1 / Speed Of Light In Medium

C.   **n = Speed Of Light In Air / Speed Of Light In Medium**

D.   n = 1 / Speed Of Light In Air

If A Light Ray Passes From Glass Into Air

A. It Does Not Bend

B. It Bends Away From The Normal

C. It Continues Along The Normal

D. It Bends Towards The Normal

denser to rarer

↓

away from normal

If A Light Ray Passes From Glass Into Air

A. It Does Not Bend

B. **It Bends Away From The Normal**

C. It Continues Along The Normal

D. It Bends Towards The Normal

What Is The Unit Of Refractive Index ?

A.   m/s

B.   cm/s

C.   No units ✓

D.   None of the above

Refractive index is ratio of speeds.

What Is The Unit Of Refractive Index ?

A.   m/s

B.   cm/s

C.   No units

D.   None of the above

The refractive indices of two media are denoted by n_1 and n_2, and the velocities of light in these two media are respectively v_1 and v_2. If n_2 / n_1 is 1·5, which one of the following statements is correct?

(a) v_1 is 1·5 times v_2.

(b) v_2 is 1·5 times v_1.

(c) v_1 is equal to v_2.

(d) v_1 is 3 times v_2.

$$\frac{n_2}{n_1} = 1.5$$

$$\frac{\dfrac{c}{v_2}}{\dfrac{c}{v_1}} = 1.5 \quad \Rightarrow \quad \frac{v_1}{v_2} = 1.5$$

$$\boxed{v_1 = 1.5\, v_2}$$

v_1 is 1·5 times v_2.

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(d) v_1 is 3 times v_2.

ANSWER : (A)

Which one of the following statements about the refractive index of a material medium with respect to air is correct ?

(a) It can be either positive or negative α

(b) It can have zero value α

(c) It is unity for all materials α
$\overline{(1)}$

(d) It is always greater than one ✓

$$\frac{n_{medium}}{n_{air}} = \frac{(\ )}{1}$$
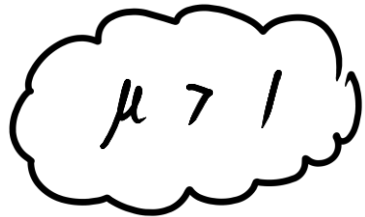
absolute refractive index of medium,

$$\frac{speed\ of\ light\ in\ air}{speed\ of\ light\ in\ medium} = \frac{3 \times 10^8\ m/s}{}$$

As, $c > v$ (speed of light in air > speed of light in medium)

$$\frac{c}{v} > 1$$

$$\mu > 1$$

Which one of the following statements about the refractive index of a material medium with respect to air is correct ?

(a) It can be either positive or negative

(b) It can have zero value

(c) It is unity for all materials

(d) It is always greater than one

ANSWER : (D)

If the focal length of a convex lens is 50 cm, which one of the following is its power?

(a) +2 dioptre

(b) +0.02 dioptre

(c) −0.5 dioptre

(d) +0.5 dioptre

$$f = \underline{+ve}$$

$$P = \frac{100}{f(\text{in cm})} = \frac{100}{+50\,cm} = +2\,D$$

If the focal length of a convex lens is 50 cm, which one of the following is its power?

(a) +2 dioptre

(b) +0·02 dioptre

(c) −0·5 dioptre

(d) +0·5 dioptre

ANSWER : (A)

The Sun is seen little before it rises and for a short while after it sets. This is because of

(a) total internal reflection

(b) atmospheric refraction

(c) apparent shift in the direction of Sun

(d) dispersion

The Sun is seen little before it rises and for a short while after it sets. This is because of

(a) total internal reflection

(b) atmospheric refraction

(c) apparent shift in the direction of Sun

(d) dispersion

ANSWER : (B)

Which one of the following statements regarding lenses is *not* correct?

(a) A convex lens produces both real and virtual images.

(b) ✓ A concave lens produces both real and virtual images. → *only virtual images,*

(c) A convex lens can produce images equal, greater and smaller than the size of the object.

(d) A concave lens always produces images smaller than the size of the object.

Which one of the following statements regarding lenses is *not* correct ?

(a) A convex lens produces both real and virtual images.

(b) A concave lens produces both real and virtual images.

(c) A convex lens can produce images equal, greater and smaller than the size of the object.

(d) A concave lens always produces images smaller than the size of the object.

ANSWER : (B)

Light rays move in straight lines. But through an optical fibre, they can move in any type of zigzag path because

(a) the holes through the fibre are extremely fine.

(b) light rays are absorbed at the entry end and relieved at the exit end of the fibre.

(c) scattering of light occurs inside the fibre.

(d) successive total internal reflections occur as a ray moves through the fibre.

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(d) successive total internal reflections occur as a ray moves through the fibre.

ANSWER : (D)

A lemon kept in water in a glass tumbler appears to be larger than its actual size. It is because of

(a) reflection of light

(b) scattering of light

(c) refraction of light

(d) polarization of light

A lemon kept in water in a glass tumbler appears to be larger than its actual size. It is because of

(a) reflection of light

(b) scattering of light

(c) refraction of light

(d) polarization of light

ANSWER : (C)

A lens has a power of +2·0 Dioptre. Which one of the following statements about the lens is true ?

(a) The lens is concave and has a focal length of 0·5 metre

(b) The lens is convex and has a focal length of 2·0 metre

(c) The lens is convex and has a focal length of 0·5 metre

(d) The lens is concave and has a focal length of 2·0 metre

$$P = \frac{1}{f \, (\text{in } m)}$$

$$f = \frac{1}{+2.0} = +0.5 \, m$$

Convex lens

(+ve focal length)

A lens has a power of +2·0 Dioptre. Which one of the following statements about the lens is true ?

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(b) The lens is convex and has a focal length of 2·0 metre

(c) The lens is convex and has a focal length of 0·5 metre

(d) The lens is concave and has a focal length of 2·0 metre

ANSWER : (C)

The refractive index of fused quartz is 1·46 and that of sapphire is 1·77. If v_q is the speed of light in quartz and v_s is the speed of light in sapphire, then which one of the following relations is correct ?

(a) $v_q > v_s$ ✓

(b) $v_s > v_q$

(c) $v_s = v_q$

(d) $v_s = \dfrac{v_q}{2}$

$n_q = 1.46$ $\qquad$ $n_s = 1.77$

$n_s > n_q$ $\Big\}$ inverse relation

$v_s < v_q$

The refractive index of fused quartz is 1·46 and that of sapphire is 1·77. If v_q is the speed of light in quartz and v_s is the speed of light in sapphire, then which one of the following relations is correct ?

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(b) $v_s > v_q$

(c) $v_s = v_q$

(d) $v_s = \dfrac{v_q}{2}$

ANSWER : (A)

Twinkling of stars is due to

(a) particular frequencies of the starlight.

(b) reflection of starlight from the oceanic surface.

(c) atmospheric refraction of starlight.

(d) magnetic field of Earth.

Twinkling of stars is due to

(a)   particular frequencies of the starlight.

(b)   reflection of starlight from the oceanic surface.

(c)   atmospheric refraction of starlight.

(d)   magnetic field of Earth.

ANSWER : (C)

Power of a lens of focal length 25 cm is

(a) +2·5 Dioptre

(b) +3 Dioptre

(c) +4 Dioptre

(d) +5 Dioptre

$$P = \frac{100}{25} = +4\ D$$

Power of a lens of focal length 25 cm is

(a)   +2·5 Dioptre

(b)   +3 Dioptre

(c)   +4 Dioptre

(d)   +5 Dioptre

ANSWER : (C)

When A Ray Of Light Enters From One Medium To Another , Which Of The

Following Does Not Change ?

A. Speed ❌

B. Frequency ✓

C. Both ❌

D. None Of The Above

Frequency of light remains same.

When A Ray Of Light Enters From One Medium To Another , Which Of The

Following Does Not Change ?

A. Speed

B. Frequency

C. Both

D. None Of The Above

Which of the following materials cannot be used to make a lens ?

A. Glass

B. Water

C. Clay

D. Plastic

has to be transparent material.

Which of the following materials cannot be used to make a lens ?

A. Glass

B. Water

C. Clay

D. Plastic

The Refraction Of Light Is Commonly Known As ?

A. Bending

B. Scattering

C. Reflection

D. Interference

The Refraction Of Light Is Commonly Known As ?

A. Bending

B. Scattering

C. Reflection

D. Interference

Mirage is an illustration of

(a)   only dispersion of light.

(b)   only reflection of light.

(c)   only total internal reflection of light.

(d)   both refraction and total internal reflection of light.
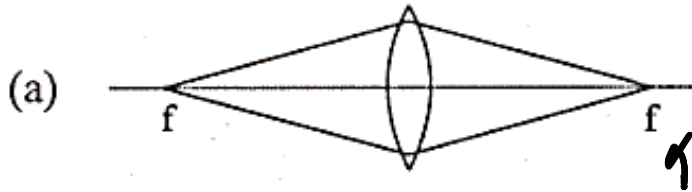
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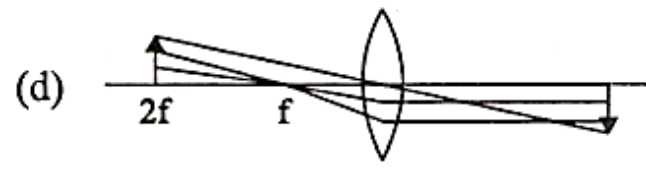
ANSWER : (D)
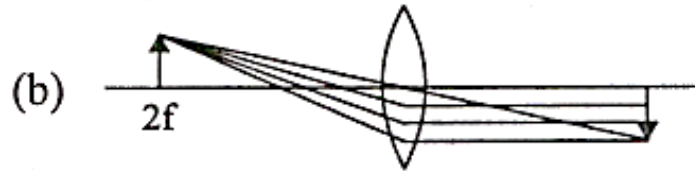
Which one among the following figures correctly represents the ray diagram ? (Consider the lens to be thin)

(a)

f   f

(c)

2f

(b)

2f

(d)

2f   f
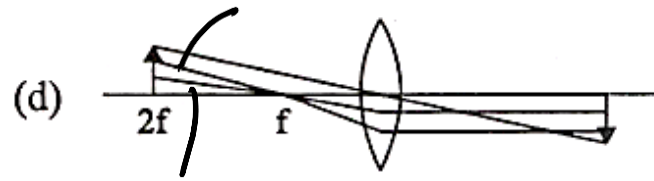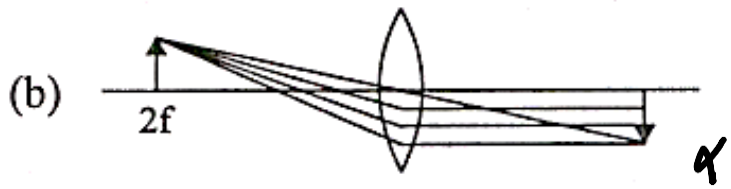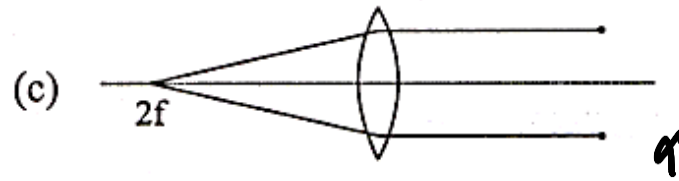
Light rays from focus, goes parallel after getting refracted from lens.
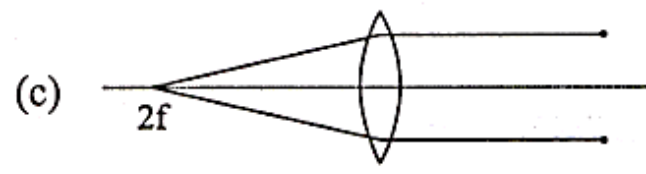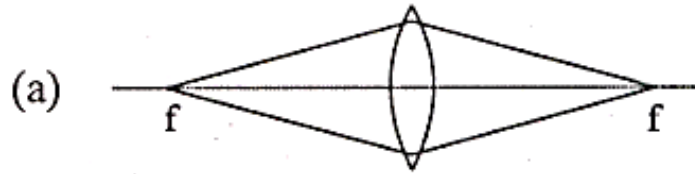
Which one among the following figures correctly represents the ray diagram ? (Consider the lens to be thin)

(a)

f   f

(c)

2f

(b)

2f

(d)

2f   f

ANSWER : (D)

Which one among the following is the correct focal length of a combination of lenses of power 2·5 D and –2·0 D ?

(a) +0·5 m

(b) –0·5 m

(c) +2·0 m ✓

(d) –2·0 m

combined power,

$$P = P_1 + P_2$$

$$= 2.5D - 2.0D$$

$$= +0.5 D$$

$$+ 0.5 = \frac{1}{f (in\ m)}$$

$$\Rightarrow f = \frac{1}{+0.5} = \boxed{+2\ m}$$

Which one among the following is the correct focal length of a combination of lenses of power 2·5 D and –2·0 D ?

(a) +0·5 m

(b) –0·5 m

(c) +2·0 m

(d) –2·0 m

ANSWER : (C)

A pencil is placed upright at a distance 10 cm from a convex lens of focal length 15 cm. The nature of the image of the pencil will be

(a) real, inverted and magnified
(b) real, erect and magnified
(c) virtual, erect and reduced
(d) virtual, erect and magnified ✓

object is between f_1 and O

10 cm

P_1

15 cm

O
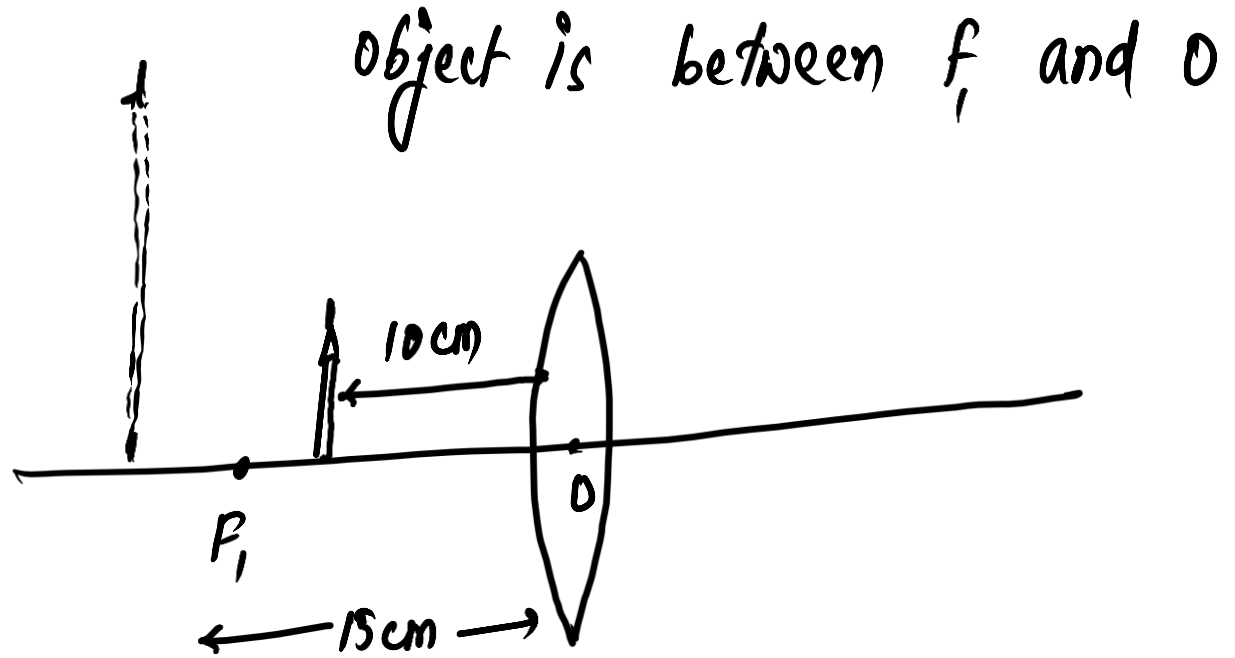
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(a) real, inverted and magnified
(b) real, erect and magnified
(c) virtual, erect and reduced
(d) virtual, erect and magnified

ANSWER : (C)

Which one of the following statements is not correct?

(a) The radius of curvature of a concave mirror is twice its focal length ✓

(b) Power of a convex lens is negative and that of a concave lens is positive ✗

(c) The radius of curvature of a plane mirror is infinity

(d) When a ray of light passes from an optically denser medium to an optically rarer medium, then the angle of refraction is greater than the corresponding angle of incidence

$$P = +ve \Rightarrow f = +ve \ (Convex \ lens)$$

$$P = -ve \Rightarrow f = -ve \ (concave \ lens)$$

Which one of the following statements is not correct?

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(b) Power of a convex lens is negative and that of a concave lens is positive

(c) The radius of curvature of a plane mirror is infinity

(d) When a ray of light passes from an optically denser medium to an optically rarer medium, then the angle of refraction is greater than the corresponding angle of incidence

ANSWER : (B)

Which one of the following statements is correct?

(a) The image formed by a concave mirror for an object lying at infinity is at the principal focus, highly diminished, real and inverted ✓

(b) A ray of light parallel to the principal axis after reflection from a concave mirror appears to diverge from the principal focus of the mirror

it converges

(c) The focal length of a spherical mirror is double of its radius of curvature

half

(d) A ray of light travelling from a rarer medium to a denser medium bends away from the normal

towards

Which one of the following statements is correct?

ANSWER : (A)

(a) The image formed by a concave mirror for an object lying at infinity is at the principal focus, highly diminished, real and inverted

(b) A ray of light parallel to the principal axis after reflection from a concave mirror appears to diverge from the principal focus of the mirror

(c) The focal length of a spherical mirror is double of its radius of curvature

(d) A ray of light travelling from a rarer medium to a denser medium bends away from the normal

Statement I Diamond is very ✓ bright.

Statement II Diamond has very ✗ low refractive index.

(a) Both the statements are individually true and Statement II is the correct explanation of Statement I

(b) Both the statements are individually true but Statement II is not the correct explanation of Statement I

(c) Statement I is true but Statement II is false

(d) Statement I is false but Statement II is true

Statement I   Diamond is very bright.

Statement II   Diamond has very low refractive index.

(a) Both the statements are individually true and Statement II is the correct explanation of Statement I

(b) Both the statements are individually true but Statement II is not the correct explanation of Statement I

(c) Statement I is true but Statement II is false

(d) Statement I is false but Statement II is true

ANSWER : (C)

A ray of light when refracted suffers change in velocity. In this context, which one among the following statements is correct?

(a) Velocity increases as the ray passes from a rarer to a denser ✗ medium

(b) Velocity decreases as the ray passes from a denser to a rarer medium ✗

(c) Velocity decreases as the ray passes from a rarer to a denser medium ✓

(d) Change of velocity does not depend on the nature of medium

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(c) Velocity decreases as the ray passes from a rarer to a denser medium

(d) Change of velocity does not depend on the nature of medium

ANSWER : (C)

A ray of light travels from a medium of refractive index n_1 to a medium of refractive index n_2. If angle of incidence is i and angle of refraction is r, then $\dfrac{\sin i}{\sin r}$ is equal to
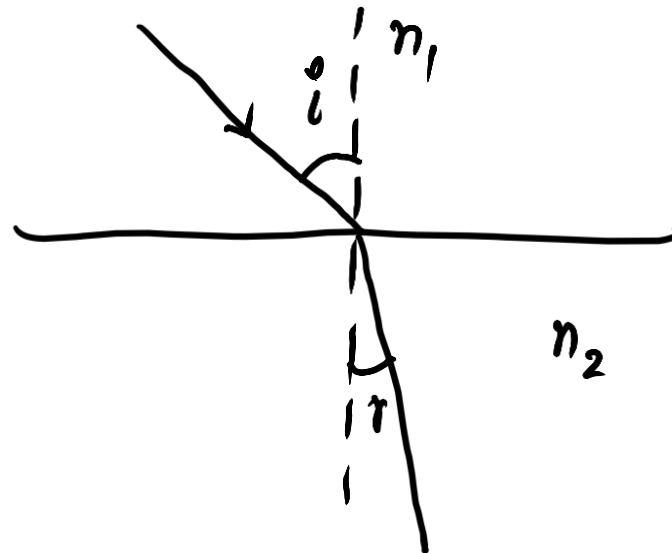
(a) n_1

(b) n_2

(c) $\dfrac{n_2}{n_1}$

(d) $\dfrac{n_1}{n_2}$

Snell 's law

$$\sin i \cdot n_1 = \sin r \cdot n_2$$

$$\left(\frac{\sin i}{\sin r} = \frac{n_2}{n_1} \right)$$

n_1

i

n_2

r

A ray of light travels from a medium of refractive index n_1 to a medium of refractive index n_2. If angle of incidence is i and angle of refraction is r, then $\dfrac{\sin i}{\sin r}$ is equal to

(a) n_1

(b) n_2

(c) $\dfrac{n_2}{n_1}$

(d) $\dfrac{n_1}{n_2}$

ANSWER : (C)

If speed of light in air is 3×10^8 m/s, then the speed of light in glass (with refractive index 1.5) would be

(a) 2×10^8 m/s

(b) 4.5×10^8 m/s

(c) 3×10^8 m/s

(d) 1.5×10^8 m/s

$$\left(n = \frac{c}{v} \right)$$

$$1.5 = \frac{3 \times 10^8}{v}$$

$$v = \frac{3 \times 10^8}{1.5} \, m/s = \boxed{2 \times 10^8 \, m/s}$$

If speed of light in air is 3×10^8 m/s, then the speed of light in glass (with refractive index 1.5) would be

(a) 2×10^8 m/s

(b) 4.5×10^8 m/s

(c) 3×10^8 m/s

(d) 1.5×10^8 m/s

ANSWER : (A)

Rays of light get refracted while passing from air to glass because

(a) density of glass is higher than that of air

(b) they cannot be reflected from a glass surface

(c) glass absorbs energy from the light rays

(d) speed of light in glass is less than the speed of light in air ✓

density ✗

optical density ✓
or,
refractive index

Rays of light get refracted while passing from air to glass because

(a) density of glass is higher than that of air
(b) they cannot be reflected from a glass surface
(c) glass absorbs energy from the light rays
(d) speed of light in glass is less than the speed of light in air

ANSWER : (D)

An optician prescribes a power = − 0.5 D. The corresponding lens must be a

(a) convex lens of focal length 2 m
(b) convex lens of focal length 50 cm
(c) concave lens of focal length 2 m
(d) concave lens of focal length 50 cm

$$f = \frac{1}{P} = \frac{1}{-0.5} = -2\, m$$

concave lens

An optician prescribes a power
$=- 0.5$ D. The corresponding lens
must be a

(a) convex lens of focal length 2 m
(b) convex lens of focal length 50 cm
(c) concave lens of focal length 2 m
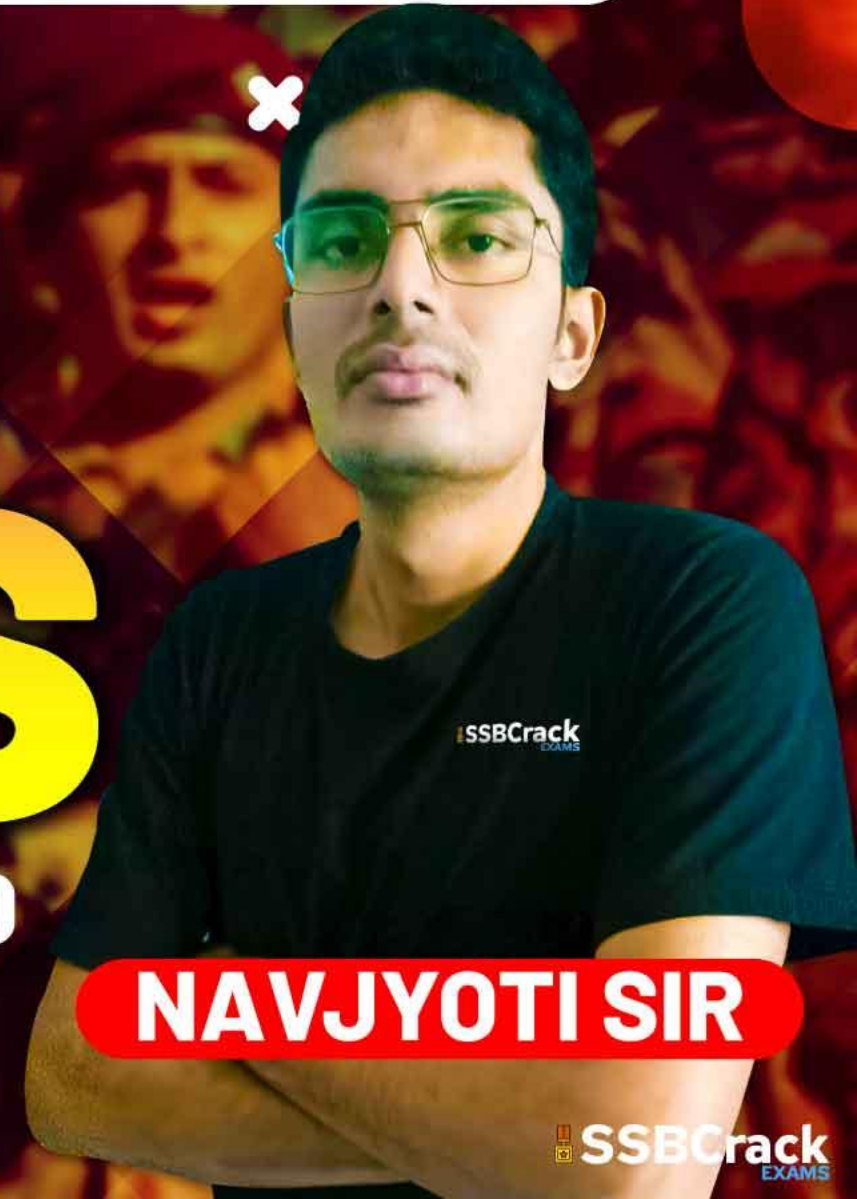(d) concave lens of focal length 50 cm

ANSWER : (C)