PHYSICS

BOOKS - X BOARDS

QUESTION PAPER 2022 TERM 1 SET 2

Section A

1. If a lens and a spherical mirror both have a focal length of - 15 cm, then it may be concluded that:

A. Both are concave

B. The lens is concave and the mirror is

    convex

C. The lens is convex and the mirror is

    concave

D. Both are convex

Answer:

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2. An optical device forms an erect image of an object placed in front of it. If the size of the image is one half that of the object, the optical device is a :

    A. Concave mirror

    B. Convex mirror

    C. Plane mirror

    D. Convex lens

Answer:

3. A student determines the focal length of a device 'A' by focussing the image of a far off object on a screen placed on the opposite side of the object. The device 'A' is:

A. Concave lens

B. Concave mirror

C. Convex lens

D. Convex mirror

Answer:

4. When light is incident on a glass slab, the incident ray, refracted ray and the emergent ray are in three media A, B and C. If n_1, n_2 and n_3 are the refractive indices of A, B and C respectively and the emergent ray is parallel to the incident ray, which of the following is true ?

A. $n_1 < n_2 < n_3$

B. $n_1 > n_2 > n_3$

C. $n_1 < n_2 = n_3$

D. $n_1 = n_3 < n_2$

Answer:

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5. The image of a candle flame formed by a lens is obtained on a screen placed on the other side of the lens. According to new

cartesian sign convention, if the image is three times the size of the flame, then the lens is :

A. Concave and magnification is + 3

B. Concave and magnification is - 3

C. Convex and magnification is - 3

D. Convex and magnification is +3

Answer:

6. The power of a combination of two lenses in contact is + 1.0 D. If the focal length of one of the lenses of the combination is + 20.0 cm, the focal length of the other lens would be:

A. $-120.0cm$

B. $+80.0cm$

C. $-25.0cm$

D. $-20.0cm$

Answer:

7. When a ray of light passes through a glass prism it suffers two refractions. During these refractions the ray bends :

    A. Away from the base in both cases

    B. Towards the base in both cases

    C. Towards the base in first case and away from the base in second case

    D. Away from the base in first case and towards the base in second case

Answer:

8. To an astronaut the sky on the moon appears dark because :

   A. There is no light on the moon

   B. There is no atmosphere on the surface

   of the moon

   C. Moon is a non-luminous object

D. The surface of the moon absorbs all the

sunlight

Answer:

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1. Assertion (A) : Kerosene having higher

refractive index is optically denser than water,

although its mass density is less than that of

water.

Reason (R) : The speed of light decides whether a medium is optically rarer or optically denser. As optically denser medium may not possess greater mass density.

A. Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

B. Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A)

C. Assertion (A) is true, but Reason (R) is
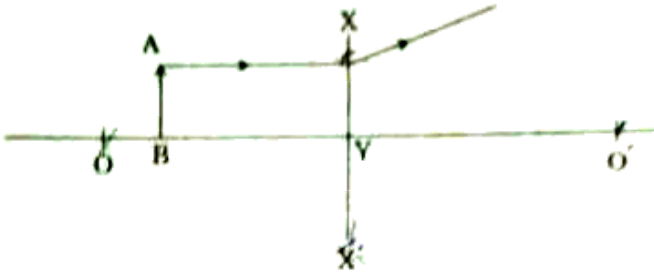
false.

D. Assertion (A) is false, but Reason (R)is

true.

Answer:

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2. Study the diagram below and identify the

type of the lens XX' and the position of the

point on the principal axis OO' where the

image of the object AB appears to be formed

A. Concave , between O' and Y

B. Concave , between O and Y

C. Convex , between O' and Y

D. Convex, between O and Y

Answer:

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3. The image of an object placed in front of a concave mirror of focal length 15 cm is of the same size as the object . The distance between the object and its image is

A. 15 cm

B. 20 cm

C. 60 cm

D. Zero

Answer:

4. An object of height 3.0 cm is placed vertically on the principal axis of a convex lens. When the object distance is - 37 .5 cm. an image of height - 2.0 cm is formed at a distance of 25.0 cm form the lens . Next the same object is place vertically at 25.0 cm from the lens . In this situation the image distance v and height h of the image is (according to the new Cartesian sign convention)

A. v = + 37.5 cm, h = + 4.5

B. v = - 37 . 5 cm, h = + 4.5 cm

C. v = + 37 . 5 cm, h = - 4.5 cm

D. v = - 37 . 5 cm, h = - 4.5 cm

Answer:

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5. The relation R = 2f is valid:

A. For concave mirrors but not for convex

mirrors

B. for convex mirrors but not for concave

mirrors

C. Neither for convace mirrors nor for

convex mirrors

D. For both concave and convex mirrors

Answer:

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6. A lens has a power of + 4.0 D . It is

A. A conves lens of focal length 4 m

B. A concave lens of focal length 4 m

C. A convex lens of focal length 0.25 m

D. A concave lens of focal length 0.25 m

Answer:

7. An object is place in front of a concave lens .

For all positions of the object the image

formed is always

A. Real, diminished and inverted

B. Virtual, diminished and erect

C. Real, enlarged and erect

D. Virtual, erect and enlarged

Answer:

8. The twinkling of stars is due to atmospheric

:

A. Scattering of light

B. Dispersion of light

C. Tyndall effect

D. Atmospheric refraction

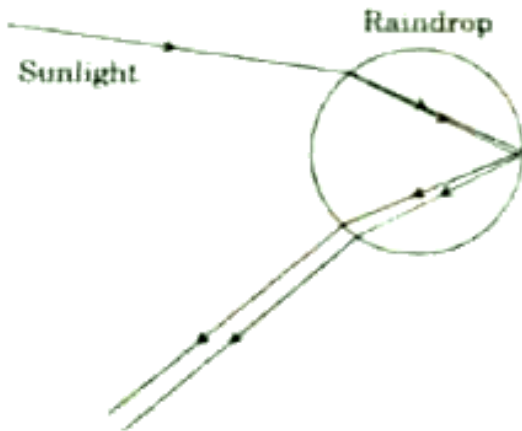**Answer:**

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Section C

1. On a sunny day, Krish looked at the sky through a water fountain and was surprised to see a rainbow in the sky.

Sunlight

Raindrop

The location of the sun when Krish observed a rainbow was:
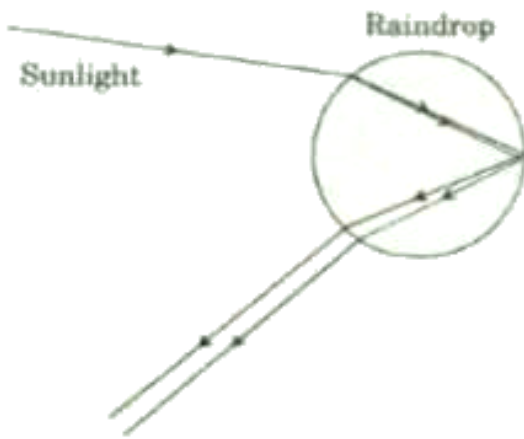
   A. Behind him

B. In front of him

C. Overhead

D. On his left side

Answer:

2. On a sunny day, Krish looked at the sky through a water fountain and was surprised to see a rainbow in the sky.

Sunlight   Raindrop

The phenomena of light involved in the formation of a rainbow are :

A. Reflection, refraction, dispersion

B. Refraction, dispersion, internal reflection

C. Refraction, dispersion, scattering

D. Dispersion, scattering, internal reflection

Answer:

3. On a sunny day, Krish looked at the sky through a water fountain and was surprised to see a rainbow in the sky.

In the formation of a rainbow, the role of water droplets present in the water fountain is to act as a :
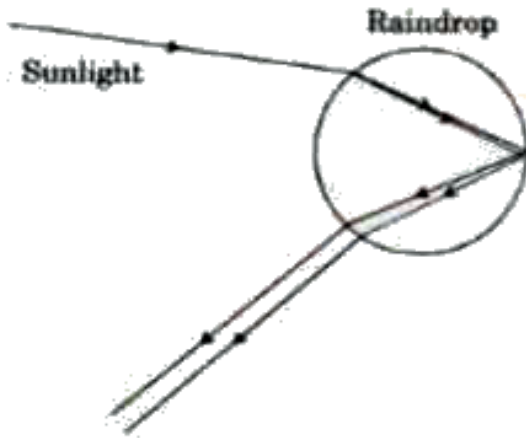
A. Glass slab

B. Convex lens

C. Concave lens

D. Prism

Answer:

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4. On a sunny day, Krish looked at the sky through a water fountain and was surprised to see a rainbow in the sky.

While entering a water droplet the sunlight gets :

A. Refracted only

B. Reflected internally

C. Refracted and dispersed

D. First refracted and then dispersed while coming out of the water droplet

Answer: