SmartKalike

CBSE Class 10 · Science

Light – Reflection and Refraction

10 most probable questions for Boards 2027

Q1. 1 mark · Multiple choice

A concave mirror can form a virtual image when the object is placed:
(A) beyond C
(B) at C
(C) between P and F
(D) at infinity

Answer

(C) between P and F — The image formed is a virtual image for a certain other position.

Q2. 2 marks · Short answer

State how the size of an image formed by a concave mirror can vary as the object's position changes. (2 marks)

Answer

The image is either magnified, reduced or has the same size, depending on the position of the object.

Q3. 3 marks · Medium answer

An object is placed 30 cm in front of a concave mirror of focal length 15 cm. Using the mirror formula and the New Cartesian Sign Convention, calculate the image distance. (3 marks)

Answer

Given: Object distance u = −30 cm; focal length f = −15 cm.
Formula: Using the mirror formula, 1/f = 1/v + 1/u.
Substitution: 1/(−15 cm) = 1/v + 1/(−30 cm).
Rearranging: 1/v = 1/(−15 cm) − 1/(−30 cm).
Calculation: 1/v = −2/30 cm^{-1} + 1/30 cm^{-1} = −1/30 cm^{-1}.
Answer: Therefore, v = −30 cm; the image forms 30 cm in front of the mirror.

Q4. 5 marks · Long answer

Define the power of a lens and write its formula in terms of focal length. State the SI unit and the power of a lens with focal length 1 m. A lens has focal length −0.25 m: calculate its power and identify the lens type.

Answer

The power of a lens is the reciprocal of its focal length and expresses its degree of convergence or divergence of light rays.
Formula: P = 1/f, where f is the focal length in metres.

The SI unit of power is dioptre, denoted by D.
A lens with focal length 1 m has power 1 D, since 1 D = 1 m^{-1}.
Given: f = −0.25 m.
Formula: P = 1/f.
Substitution: P = 1/(−0.25 m).
Calculation: P = −4 m^{-1}.
Since 1 D = 1 m^{-1}, P = −4 D.
The negative power identifies the lens as a concave lens, because the power of a concave lens is negative.
Answer: The lens has power −4 D and is concave.

Q5. 1 mark · Multiple choice

A ray parallel to the principal axis falls on a concave mirror. After reflection, it:
(A) passes through the principal focus
(B) passes through the centre of curvature
(C) travels back along its original path
(D) remains parallel to the principal axis

Answer

(A) passes through the principal focus — a ray parallel to the principal axis, after reflection, will pass through the principal focus in case of a concave mirror.

Q6. 2 marks · Short answer

How can the intersection of reflected rays locate the image of a point object? Explain why two suitably chosen rays are used to construct a clear ray diagram for an extended object. (2 marks)

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Q7. 3 marks · Medium answer

Write the relation between magnification and the object and image distances for a spherical mirror. Explain the symbols used in the relation.

Full answer on SmartKalike: https://smartkalike.com/cbse/class-10/science/light-reflection-and-refraction

Q8. 5 marks · Long answer

A camera lens system contains two lenses in contact, with powers +3.0 D and −1.0 D. Calculate the net power of the system. Name two other optical instruments that use systems of several lenses in contact.

Full answer on SmartKalike: https://smartkalike.com/cbse/class-10/science/light-reflection-and-refraction

Q9. 1 mark · Multiple choice

Which incident ray is reflected parallel to the principal axis by a concave mirror?
(A) A ray passing through its principal focus
(B) A ray parallel to its principal axis
(C) A ray directed towards its pole

(D) A ray travelling away from its centre of curvature

Full answer on SmartKalike: https://smartkalike.com/cbse/class-10/science/light-reflection-and-refraction

Q10. 2 marks · Short answer

Describe the path after reflection of a ray parallel to the principal axis incident on a convex mirror. (2 marks)

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