9. Light – Reflection and Refraction - Board Exam Questions (1 Mark)

Practice these questions online at pschool.in/science/ncert/g10/chap-9

1 Mark Questions (MCQ)

1) *A convex lens of focal length 15 cm, is forming a real image. If the size of image is same as the size of object, then position of object and position of image will be, respectively:*
(a) – 15 cm and – 15 cm from lens (b) – 15 cm and + 15 cm from lens
(c) – 30 cm and + 30 cm from lens (d) – 30 cm and – 30 cm from lens

2) *From the following options choose the one which gives negative magnification greater than one:*
(a) Concave mirror; Nature of image – real
(b) Concave mirror; Nature of image – virtual
(c) Convex mirror; Nature of image – real
(d) Convex mirror; Nature of image – virtual

3) *Rays from the sun converge at a point 25 cm behind a convex lens. The distance at which an object be placed in front of the lens to get a virtual image, is:*
(a) 20 cm (b) 40 cm (c) 50 cm (d) More than 50 cm

4) *A student wants to determine the focal length of a convex lens using sunlight. Which of the following practical procedures will give the most accurate result?*
(a) Move the lens close to a wall and measure the blurred circle
(b) Hold the lens above a sheet of paper and adjust until the smallest, brightest spot is formed
(c) Measure the thickness of the lens with a scale
(d) Look through the lens at a distant object

5) *Mirror 'X' is used to concentrate sunlight in solar furnace and Mirror 'Y' is fitted on the side of the vehicle to see the traffic behind the driver. Which of the following statements are true for the two mirrors?*
(i) The image formed by mirror 'X' is real, diminished and at its focus.
(ii) The image formed by mirror 'Y' is virtual, diminished and erect.
(iii) The image formed by mirror 'X' is virtual, diminished and erect.
(iv) The image formed by mirror 'Y' is real, diminished and at its focus.
(a) (i) and (ii) (b) (ii) and (iii) (c) (iii) and (iv) (d) (i) and (iv)

6) *If the absolute refractive indices of two media X and Y are 6/5 and 4/3 respectively, then the refractive index of Y with respect to X will be:*
(a) 10/9 (b) 9/10 (c) 9/8 (d) 8/9

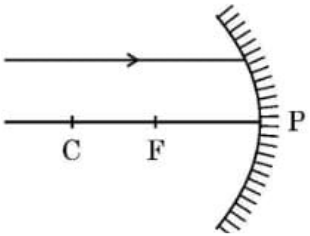
7) *An object is placed at a distance of 30 cm from the pole of a concave mirror. If its real and inverted image is formed at 60 cm in front of the mirror, the focal length of the mirror is:*
(a) –15 cm (b) –20 cm (c) +20 cm (d) +15 cm

8) *To get an image of magnification –1 on a screen using a lens of focal length 20 cm, the object distance must be:*
(a) Less than 20 cm (b) 30 cm (c) 40 cm (d) 80 cm

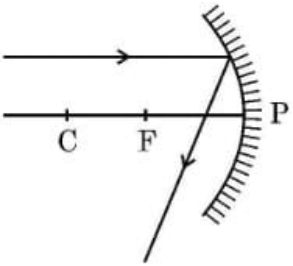
9) *An optical device 'X' is placed obliquely in the path of a narrow parallel beam of light. If the emergent beam gets displaced laterally, the device 'X' is:*
(a) plane mirror (b) convex lens (c) glass slab (d) glass prism

10) *In order to obtain large images of the teeth of patients, the dentist holds the concave mirror in such a manner that the teeth are positioned*
(a) at the focus of mirror
(b) between pole and focus of the mirror
(c) between focus and centre of curvature of the mirror
(d) at the centre of curvature of the mirror

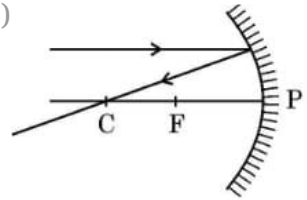
11) *Identify from the following the ray diagram which shows the correct path of the reflected ray for the ray incident on a concave mirror as shown:*



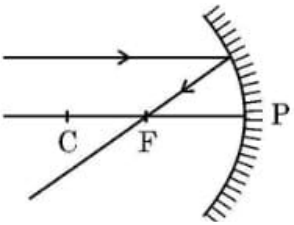
(a)



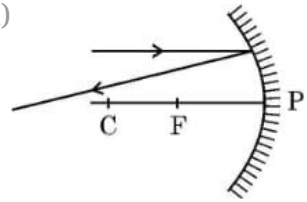
(b)



(c)



(d)



12) *Arnav was making notes and he wrote down the following statements from his understanding of reflection from curved surfaces.*
I. Concave mirrors can produce both real and virtual images depending on the position of the object.
II. Convex mirrors always produce real, inverted images regardless of the object's position.
III. In both concave and convex mirrors, the image location can be determined using the mirror formula 1/f = 1/v + 1/u where f is the focal length, v is the image distance, and u is the object distance.
Choose from the following the correct option that lists the correct statements about reflection from curved surfaces.

(a) I and II (b) I, II and III (c) II and III (d) I and III

13) *At what distance from a convex lens should an object be placed to get an image of the same size as that of the object on a screen?*
(a) Beyond twice the focal length of the lens
(b) At the principal focus of the lens
(c) At twice the focal length of the lens
(d) Between the optical centre of the lens and its principal focus

14) *Absolute refractive index of glass and water is 3/2 and 4/3 respectively. If the speed of light in glass is 2×10^8 m/s, the speed of light in water is:*
(a) $9/4 \times 10^8$ m/s (b) $5/2 \times 10^8$ m/s (c) $7/3 \times 10^8$ m/s (d) $16/9 \times 10^8$ m/s

15) *How will the image formed by a convex lens be affected, if the upper half of the lens is wrapped with a black paper?*
(a) The size of the image formed will be one-half of the size of the image due to complete lens
(b) The image of upper half of the object will not be formed
(c) The brightness of the image will reduce
(d) The lower half of the inverted image will not be formed

16) *In the following cases, a ray is incident on a concave mirror. In which case is the angle of incidence equal to zero?*
(a) A ray parallel to the principal axis
(b) A ray passing through the centre of curvature and incident obliquely
(c) A ray passing through the principal focus and incident obliquely
(d) A ray incident obliquely to the principal axis, at the pole of the mirror

17) *An object is placed in front of a convex mirror at infinity. According to the New Cartesian Sign Convention, the sign of the focal length and the sign of the image distance in this case are respectively:*
(a) +, − (b) −, + (c) −, − (d) +, +

18) *A student wants to obtain an erect image of an object using a concave mirror of 10 cm focal length. What will be the distance of the object from mirror?*
(a) Less than 10 cm (b) 10 cm
(c) between 10 cm and 20 cm (d) more than 20 cm

19) *An object is placed in front of a convex mirror. Its image is formed:*
(a) at a distance equal to the object distance in front of the mirror
(b) at twice the distance of the object in front of the mirror
(c) half the distance of the object in front of the mirror
(d) behind the mirror and it's position varies according to the object distance

Assertion and Reason

1) *Assertion (A): The apparent depth of a coin in water is less than its real depth.*
Reason (R): Light bends away from the normal when it travels from water to air.

2) *Assertion (A): A point object is placed at a distance of 26 cm from a convex mirror of focal length 26 cm. The image will not form at infinity.*
Reason (R): For above given system the equation $1/f = 1/v + 1/u$ gives $v = \infty$.

3) *Assertion (A): A convex mirror always forms an image behind it and the image formed is virtual.*
Reason (R): According to the sign convention, the focal length of a convex mirror is positive.