## Science

(Chapter-15) (Light)
(Class - VII)

## Exercises

## Question 1:

Fill in the blanks:
(a) An image that cannot be obtained on a screen is called $\qquad$ .
(b) Image formed by a convex $\qquad$ is always virtual and smaller in size.
(c) An image formed by a $\qquad$ mirror is always of the same size as that of the object.
(d) An image which can be obtained on a screen is called a $\qquad$ image.
(e) An image formed by a concave $\qquad$ cannot be obtained on a screen.
Answer 1:
(a) An image that cannot be obtained on a screen is called virtual image.
(b) Image formed by a convex mirror is always virtual and smaller in size.
(c) An image formed by a plane mirror is always of the same size as that of the object.
(d) An image which can be obtained on a screen is called a real image.
(e) An image formed by a concave lens cannot be obtained on a screen.

## Question 2:

Mark ' $T$ ' if the statement is true and ' $F$ ' if it is false:
(a) We can obtain an enlarged and erect image by a convex mirror. (T/F)
(b) A concave lens always form a virtual image. (T/F)
(c) We can obtain a real, enlarged and inverted image by a concave mirror. (T/F)
(d) A real image cannot be obtained on a screen. (T/F)
(e) A concave mirror always form a real image. (T/F)

## Answer 2:

(a) We can obtain an enlarged and erect image by a convex mirror. (F)
(b) A concave lens always form a virtual image. (T)
(c) We can obtain a real, enlarged and inverted image by a concave mirror. (T)
(d) A real image cannot be obtained on a screen. (F)
(e) A concave mirror always form a real image. (F)

## Question 3:

Match the items given in Column I with one or more items of Column II.

## Column I

(a) A plane mirror
(b) A convex mirror
(c) A convex lens
(d) A concave mirror
(e) A concave lens

## Column II

(i) Used as a magnifying glass.
(ii) Can form image of objects spread over a large area.
(iii) Used by dentists to see enlarged image of teeth.
(iv) The image is always inverted and magnified.
(v) The image is erect and of the same size as the object.
(vi) The image is erect and smaller in size than the object.


## Answer 3:

## Column I

(a) A plane mirror
(b) A convex mirror
(c) A convex lens
(d) A concave mirror
(e) A concave lens

## Column II

(v) The image is erect and of the same size as the object.
(ii) Can form image of objects spread over a large area.
(i) Used as a magnifying glass.
(iii) Used by dentists to see enlarged image of teeth.
(vi) The image is erect and smaller in size than the object.

## Question 4:

State the characteristics of the image formed by a plane mirror.
Answer 4:
Characteristics of the image formed by a plane mirror:
$>$ Virtual and erect.
$>$ Behind the mirror.
$>$ Size of image is equal to size of object.
$>$ Laterally inverted image (image of left side visible on right side).
$>$ Distance of image behind the mirror is equal to distance of object in front of mirror.

## Question 5:

Find out the letters of English alphabet or any other language known to you in which the image formed in a plane mirror appears exactly like the letter itself. Discuss your findings.

Answer 5:
$\mathrm{A}, \mathrm{H}, \mathrm{I}, \mathrm{M}, \mathrm{O}, \mathrm{T}, \mathrm{U}, \mathrm{V}, \mathrm{W}$ and X are the letters which form same image as the letter is. These letters are laterally symmetrical.

## Question 6:

What is a virtual image? Give one situation where a virtual image is formed.
Answer 6:
The image, which cannot be obtained on a screen, is called virtual image. The images formed by plane mirror, convex mirror and concave lens are virtual.


## Question 7:

State two differences between a convex and a concave lens.
Answer 7:
> A convex lens can make images which are enlarged or smaller or equal to the size of the object whereas concave lens can always make smaller image.
> A convex lens makes both real image and virtual images whereas a concave lens always makes a virtual image.

## Question 8:

Give one use each of a concave and a convex mirror.
Answer 8:
$>$ Concave mirror is used by dentist, solar furnace, reflector of a torch, etc.
$>$ Convex mirror is used in rear view mirrors.

## Question 9:

Which type of mirror can form a real image?
Answer 9:
Concave mirror.

## Question 10:

Which type of lens forms always a virtual image?
Answer 10:
Concave lens.

## Question 11:

## Choose the correct option:

A virtual image larger than the object can be produced by a
(i) concave lens
(iii) convex mirror
(ii) concave mirror

Answer 11:
(ii) concave mirror


## Question 12:

## Choose the correct option:

David is observing his image in a plane mirror. The distance between the mirror and his image is 4 m . If he moves 1 m towards the mirror, then the distance between David and his image will be
(i) 3 m
(ii) 5 m
(iii) 6 m
(iv) 8 m

Answer 12:
(iii) 6 m

## Explanation:

As David moves 1 m towards the mirror, the image also moves 1 m towards the mirror. Now the distance between David and mirror is 3 m and the distance between mirror and image is 3 m . So, the total distance between David and his image will be 6 m .

## Question 13:

## Choose the correct option

The rear view mirror of a car is a plane mirror. A driver is reversing his car at a speed of $2 \mathrm{~m} / \mathrm{s}$. The driver sees in his rear view mirror the image of a truck parked behind his car. The speed at which the image of the truck appears to approach the driver will be
(i) $1 \mathrm{~m} / \mathrm{s}$
(ii) $2 \mathrm{~m} / \mathrm{s}$
(iii) $4 \mathrm{~m} / \mathrm{s}$
(iv) $8 \mathrm{~m} / \mathrm{s}$

## Answer 13:

(ii) $2 \mathrm{~m} / \mathrm{s}$

## Explanation:

As the car moves 2 m backward, the mirror also moves 2 m backward, so image comes 2 m forward.


