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 _____.

(b) Image formed by a convex _____ is always virtual and smaller in size.

(c) An image formed by a _____ 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 _____ image.

(e) An image formed by a concave _____ 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	Column II
(a) A plane mirror	(i) Used as a magnifying glass.
(b) A convex mirror	(ii) Can form image of objects spread over a large area.
(c) A convex lens	(iii) Used by dentists to see enlarged image of teeth.
(d) A concave mirror	(iv) The image is always inverted and magnified.
(e) A concave lens	(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	Column II
(a) A plane mirror	(v) The image is erect and of the same size as the object.
(b) A convex mirror	(ii) Can form image of objects spread over a large area.
(c) A convex lens	(i) Used as a magnifying glass.
(d) A concave mirror	(iii) Used by dentists to see enlarged image of teeth.
(e) A concave lens	(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:

A, H, I, M, O, T, U, V, 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 (ii) concave mirror

(iii) convex mirror (iv) plane 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 m/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 m/s (ii) 2 m/s

(iii) 4 m/s (iv) 8 m/s

Answer 13:

(ii) 2 m/s

Explanation:

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