LIGHT

EXERCISE

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:

(a) virtual image
(b) mirror
(c) plane
(d) real
(e) lens

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

Answer:

(a) F
(b) T
(c) T
(d) F
(e) 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 the image of objects spread over a large area.
(c) A convex lens	(iii) Used by dentists to see an 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:
(a)–(v),
(b)–(ii), (vi),
(c)–(i),
(d)–(iii),
(e)–(iv)

Question 4:
State the characteristics of the image formed by a plane mirror.

Answer:
Characteristics of the image formed by the plane mirror are:
(i) It is virtual.
(ii) It is erect.
(iii) It is of the same size.
(iv) It is at the same distance from the mirror as the distance of an object from the mirror.

Question 5:
Find out the letters of the 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:
Image formed by the plane mirror shows lateral inversion, i.e., left seems to be right and vice-versa.

In case of alphabetic letters A, H, I, M, O, T, U, V, W, X, Y show the same image in the plane mirror.

Question 6:
What is a virtual image? Give one situation where a virtual image is formed.

Answer:
An image that cannot be obtained on a screen is called a virtual image.

In the case of a plane mirror, a virtual image is formed.

Question 7:
State two differences between a convex and a concave lens.

Answer:
Difference between convex and concave lenses:

Convex lens	Concave lens
It can form real and virtual images both.	It always forms a virtual image.
Image formed by a convex lens can be enlarged or diminished depending upon the position of the object.	Image formed by a concave lens is always diminished.

Question 8:
Give two uses each of a convex and a concave mirror.

Answer:
Uses of a convex mirror:

(i) It is used in side mirrors of vehicles.

(ii) It is used as a shop security mirror.

Uses of a concave mirror:

(i) It is used in a reflector of a torch.

(ii) It is also used by dentists to see an enlarged image of the teeth.

Question 9:
Which type of mirror can form a real image?

Answer:
A concave mirror can form a real image of an object.

Question 10:
Which type of lens forms always a virtual image?

Answer:
A concave lens always forms a virtual image.

Question 11:
A virtual image larger than the object can be obtained by a
(a) convex lens
(b) concave mirror
(c) concave lens
(d) plane mirror

Answer:
(b) Concave mirror can form a real image and a virtual image of a larger size than the object.

Question 12:
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
(a) 3 m
(b) 5 m
(c) 6 m
(d) 8 m

Answer:
(c) As we know that in the case of a plane mirror, an image distance is equal to the object distance from the mirror. So, his image will be at 4 - 1 = 3 m from the mirror and the distance between David and his image is 6 m.

Question 13:
The rearview 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 rearview 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
(a) 1 m/s
(b) 2 m/s
(c) 4 m/s
(d) 8 m/s

Answer:
(b) The speed at which the image of the truck appears to approach the driver will be the same as the reverse speed of the car, i.e., 2 m/s.