

# Science

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(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

- (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.

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## 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.

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## 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.