11. Light

Objective Type Questions

1. Name the following:-

(a) Ray box

(b) (i) Diffuse reflection

(ii) Regular reflection

(c) Regular reflection

(d) Virtual

(e) Lateral Inversion

(f) Periscope

(g) A glass prism

(h) Convex lens

(i) Blind spot

(j) Persistence of vision

(k) Night blindness

(l) Kaleidoscope

2. Fill in the following blanks with suitable words:

(a) incidence

(b) 2

(c) left; left hand

(d) large

(e) fewer

(f) 1/16

(g) 16

(h) 24

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3. Sate whether the following statements are true or false:-

(a) True

(b) False

(c) True

(d) True

(e) False

(f) False

(g) True

Subjective Type Questions

Short Answer Type Questions

1. We need a source of light to make the objects visible.

a. In this case, the wooden screen acts an opaque screen and does not allow the light from the book to enter our eyes.

b. In this case, light is not reflected from the book in our eyes because the room is dark.

2. Regular reflection of light and diffuse reflection of light are the two types of reflection of light. The wall produces diffuse reflection of light while the mirror produces regular reflection of light.

3. Angle of incidence and angle of reflection respectively. The angle of reflection is always equal to the angle of incidence.

4. (i) The image formed by a plane mirror is virtual.

(ii) The image formed by a plane mirror is behind the mirror.

5. An optical instrument in which reflected light is reflected again is a periscope. A periscope is a long, tubular device through which a person can see objects that are out of the direct line of sight. A periscope works on the reflection of light from two plane mirrors arranged parallel to one another.

6. (a) 2 (b) 7 (c) 1 (d) 5 (e) 3

7. Infinite number of images

8. Take a glass prism and place it on a table in a darkened room. Place a white cardboard screen at some distance behind the prism. Allow a thin beam of sunlight to fall on the prism. We will see that the beam of white sunlight splits on entering the glass prism and forms a broad patch of seven colours on the white screen placed on the other side of prism.

9. The splitting up of white light into seven colours on passing through a transparent medium like a glass prism is called dispersion of light. Rainbow in the sky is a natural phenomenon showing the dispersion of sunlight.

10. The kaleidoscope consists of three long and narrow strips of plane mirrors inclined at 60° to one another forming a hollow prism, and fitted into a cardboard tube.

11. We can see an object when light reflected by that object reaches our eyes. In the dark room, there is no light. Hence no light is reflected by the object and we are unable to see anything. However, light is present outside the room, and on being reflected from the objects we can see the them.

12. The eye-lens is a flexible convex lens whose thickness and hence focal length can be changed by the action of Ciliary muscles. On the other hand, a glass convex lens has a fixed thickness due to which its focal length is also fixed, and cannot be changed.

13. Myopia is that defect of eye due to which a person cannot see the distant objects clearly. Myopia is corrected by using spectacles containing concave lenses of suitable power.

14. The ability of an eye to continue to see the image of an object for a very short duration even after the object has disappeared from view, is called persistence of vision. It is due to the phenomenon of persistence of vision that we are able to see movie pictures in a cinema hall.

15. In an image formed by a plane mirror, the left side of object appears on the right side in the image whereas the right side of object appears on the left side in the image. This change of sides of an object and its mirror image is called lateral inversion. For example, if we stand in front of a plane mirror and lift our left hand, then our image in the plane mirror appears to lift its right hand. And if we lift our right hand, then our image in the plane mirror appears to lift its left hand.

Long Answer Type Questions

1. (a) The objects which emit their own light are called luminous objects. The luminous objects are, in fact, the sources of light. The sun and electric bulb are two examples of luminous objects.

(b)The objects which do not emit their own light are called non-luminous objects. Actually, the non-luminous objects cannot make their own light. The moon and earth are two examples of non-luminous objects.

2. (a) In regular reflection, a parallel beam of incident light is reflected as a parallel beam in one direction. In this case, parallel incident rays remain parallel even after reflection and go only in one direction. Regular reflection of light occurs from smooth surfaces like that of a plane mirror. In diffuse reflection, a parallel beam of incident light is reflected in different directions. In this case, the parallel incident rays do not remain parallel after reflection, they are scattered in different directions.

(b) Refer to figures 9 and 10 respectively and draw yourself.

(c) Regular reflection: i. Polished wooden table, iv. Mirror, vi. Marble floor with water spread over it.

Diffuse reflection: ii. Chalk powder, iii. Cardboard, v. Paper

3. (a) Refer to figure 2 for the diagram and draw yourself. Label Everything…

(b) According to the first law of reflection: The incident ray, the reflected ray, and the normal, all lie in the same plane. According to the second law of reflection: The angle of reflection is always equal to the angle of incidence.

4. (a) Refer to the figure 16 for the diagram and draw yourself.

(b) Function of the given parts of the eye are as follows:

• Iris- The iris automatically adjusts the size of pupil according to the intensity of light received by the eye from the surroundings.

• Eye lens- The eye-lens is a convex lens, so it converges the light rays and produces a real and inverted image of the object on the retina.

• Ciliary muscles- The Ciliary muscles can change the curvature of eye-lens and make it thin or thick according to the need of the eye.

• Retina- The retina is a screen on which the image is formed in the eye.

• Optic nerve- The optic nerve carries the image formed on retina to the brain in the form of electrical signals.