

CHAPTER 11

Light: Shadows and Reflection

VEDA
ACADEMY

CLASS 7TH

NCERT SOLUTIONS - SCIENCE



P1



P2

1. Which of the following are luminous objects?

Mars, Moon, Pole Star, Sun, Venus, Mirror

ANSWER

- Sun – luminous because it produces its own light
- Pole Star – luminous because it produces its own light
- Venus, Mars, Moon and mirror – non-luminous (they do not emit their own light)

2. Match the items in Column A with those in Column B.

Column A	Column B
(i) Pinhole camera	(a) Blocks light completely
(ii) Opaque object	(b) The dark region formed behind the object
(iii) Transparent object	(c) Forms an inverted image
(iv) Shadow	(d) Light passes almost completely through it

ANSWER

- (i) Pinhole camera → (c) Forms an inverted image
(ii) Opaque object → (a) Blocks light completely
(iii) Transparent object → (d) Light passes almost completely through it
(iv) Shadow → (b) The dark region formed behind the object

3. Sahil, Rekha, Patrick, and Qasima are trying to observe the candle flame through the pipe as shown in Figure. Who can see the flame?

ANSWER

- Only Rekha can see the flame because light travels in a straight line, and her line of sight is aligned with the flame.
- The others cannot see the flame because they are not in the correct path.

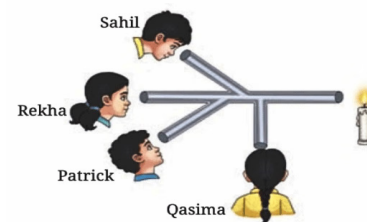


Fig. 11.16



4. Look at the images shown in Figure and select the correct image showing the shadow formation of the boy.

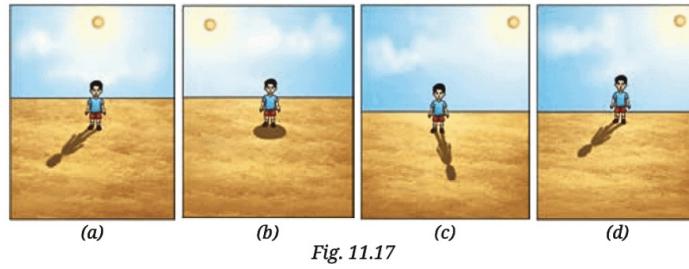


Fig. 11.17

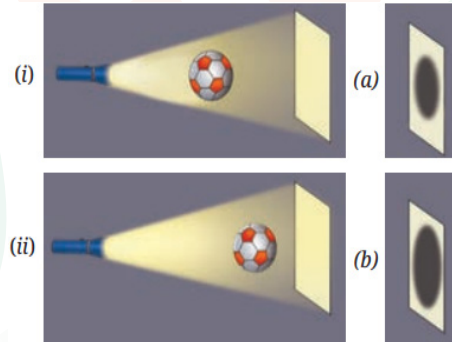
ANSWER

- The boy’s shadow depends on the light source.
- If the light is from above → shadow falls below.
- If the light is from the side → shadow falls opposite.
- Option (d) is the correct image.

5. The shadow of a ball is formed on a wall by placing the ball in front of a fixed torch.

- Scenario (i): ball closer to the torch
- Scenario (ii): ball closer to the wall

Choose the most accurate representation.



ANSWER

- Scenario (i): Ball closer to torch → shadow large and blurry → correct representation is (b).
- Scenario (ii): Ball closer to wall → shadow sharp and small → correct representation is (a).

6. Based on Figure, match the position of the torch in Column A with the characteristics of the ball’s shadow in Column B.

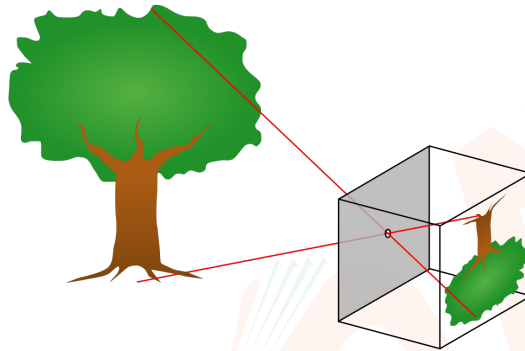
Column A	Column B
(i) Torch close to ball	(a) The shadow would be smaller
(ii) Torch far away	(b) The shadow would be larger
(iii) Ball removed from set-up	(c) Two shadows would appear on the screen
(iv) Two torches on the left side	(d) A bright spot would appear on the screen



ANSWER

- (i) Torch close to ball → (b) The shadow would be larger
- (ii) Torch far away → (a) The shadow would be smaller
- (iii) Ball removed → (d) A bright spot would appear
- (iv) Two torches present → (c) Two shadows would appear

7. Suppose you view the tree shown in Figure through a pinhole camera. Sketch the outline of the image of the tree formed in the pinhole camera.



ANSWER

- In a pinhole camera, the image is upside down and inverted because light travels in straight lines.
- The top of the object (the tree) hits the bottom of the screen, and the left side hits the right side, making the image reversed.

8. Write your name on a piece of paper and hold it in front of a plane mirror such that the paper is parallel to the mirror. Sketch the image. What difference do you notice? Explain the reason for the difference.

ANSWER

- In the plane mirror, the image will be laterally inverted (flipped horizontally).
- The letters of your name appear backward because the mirror reverses left and right.

9. Measure the length of your shadow at 9 AM, 12 PM, and 4 PM with the help of your friend. Write down your observations:

- (i) At which of the given times is your shadow the shortest?
- (ii) Why do you think this happens?

ANSWER

- (i) The shadow will be shortest at 12 PM when the Sun is directly overhead.
- (ii) This happens because at 12 PM, the Sun is at its highest point in the sky, so the angle of sunlight is nearly 90°, casting a very short shadow.



10. On the basis of following statements, choose the correct option.

Statement A: Image formed by a plane mirror is laterally inverted.

Statement B: Images of alphabets T and O appear identical to themselves in a plane mirror.

Options:

- (i) Both statements are true
- (ii) Both statements are false
- (iii) Statement A is true, but statement B is false
- (iv) Statement A is false, but statement B is true

ANSWER

(i) Both statements are true. Plane mirrors create a laterally inverted image, and alphabets like T and O look the same in a mirror.

11. Suppose you are given a tube of the shape shown in Fig. 11.20 and two plane mirrors smaller than the diameter of the tube. Can this tube be used to make a periscope? If yes, mark where you will fix the plane mirrors.



ANSWER

- Yes, the tube can be used to make a periscope.
- Place the mirrors at a 45° angle inside the tube, facing each other, so that light reflects through the tube and allows viewing from above or around obstacles.

12. We do not see the shadow on the ground of a bird flying high in the sky. However, the shadow is seen on the ground when the bird swoops near the ground. Think and explain why it is so.

ANSWER

- When the bird is high, the Sun's rays make its shadow very small and faint, so it is hard to notice.
- When the bird is closer to the ground, the angle of sunlight produces a larger and clearer shadow that can be seen easily.

