INDIAN SCHOOL AL WADI AL KABIR		
CLASS: VII	**DEPARTMENT: SCIENCE 2025-2026**	**DATE: 01/12/2025**
WORKSHEET NO: 10 WITH ANSWERS	**CHAPTER: LIGHT: SHADOWS & REFLECTIONS**	**NOTE: A4 FILE FORMAT**
NAME OF THE STUDENT	**CLASS & SEC:**	**ROLL NO.**

I.OBJECTIVE-TYPE QUESTIONS:

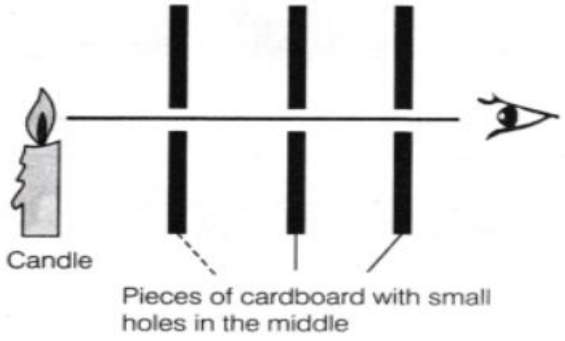
1. Which of the following statements is correct?
   (a) The image is real in a plane mirror.
   (b) The image is inverted in a plane mirror.
   (c) The distance of the object from the mirror is equal to the distance of the image from the mirror.
   (d) If the object is 10cm tall, the image in the plane mirror is 5cm.

2. If we look at our image in the plane mirror:
   (a) Our right hand is the right hand of the image.
   (b) Our image is upside down.
   (c) Our left hand is the left hand of the image.
   (d) Our right hand is the left hand of the image.

3. A plane mirror forms a virtual image. The distance between Maria and her image in a plane mirror is 10 m. How much distance should she move to get the distance of 5 m between herself and her image?
   (a) 2.5 m away from the mirror.
   (b) 2.5 m towards the mirror.
   (c) 5 m away from the mirror.
   (d) 5 m towards the mirror.

4. A periscope works on the principle of:
   (a) Refraction of light.
   (b) Diffusion of light.
   (c) Reflection of light.
   (d) Absorption of light.

5. The experiment in the diagram shows that:



(a) Light rays are very thin.
(b) Light can travel in zig-zag paths.
(c) Light rays travel in straight lines.
(d) Light can travel only through air.

6. A toy contains 3 inclined plane mirrors which produce multiple reflections and create beautiful patterns. Identify the name of the toy.
   (a) Telescope
   (b) Kaleidoscope
   (c) Microscope
   (d) Periscope

7. Sahil stood 3 m away from a plane mirror. He then moved 1 m away. Now, the distance between him and the image is:
   (a) 4 m
   (b) 8 m
   (c) 6 m
   (d) 3 m

For the following questions, two statements are given- one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (i), (ii), (iii), and (iv) as given below

i) Both A and R are true, and R is the correct explanation of the assertion.

ii) Both A and R are true, but R is not the correct explanation of the assertion.

iii) A is true, but R is false.

iv) A is false, but R is true

8. **Assertion (A):** A periscope can be used to see objects that are not in the direct line of sight.
   Reason (R): A periscope uses multiple reflections through mirrors placed at 45°.

9. **Assertion(A):** In a plane mirror, the image of a red rose looks red, whereas its shadow is black.
   Reason(R): The image is of the same colour as the object, and the shadow is always dark.

10. **Assertion:** The image formed by a plane mirror is always upright.
    Reason: A plane mirror forms a real image that can be obtained on a screen.

II. VERY SHORT ANSWER TYPE QUESTIONS: (2M)

1. a) What is light?
   [Hint: A form of energy that enables us to see things around us.]
   b) Name any four different sources of light.
   [Hint: sun, stars, an electric bulb and a burning candle]

2. a) What do you mean by rectilinear propagation of light?
   [Hint: The property of light travelling in a straight line.]
   b) What makes things visible to us?
   [Hint: Objects are visible only when light reflected from them reaches our eyes.]

3. What is a pinhole camera? State the principle behind the working of a pinhole camera.
[Hint: A pinhole camera is a device in which the light rays from an object pass through a tiny hole (a pinhole) and form an image on a screen. The principle behind the working of a pinhole camera is rectilinear propagation of light.]

4. a) What is the reflection of light?
[Hint: The change in the direction of the light by a mirror or shiny surface is called reflection of light.]
b) What is lateral inversion?
[Hint: A mirror forms an image such that its left side is the object's right side and its right side is the object's left side.]

5. What are the essential conditions for the formation of a shadow?
[Hint:
- A source of light,
- An opaque object, and
- A screen to observe a shadow.

The object must be placed in the path of light. Then only a shadow is formed on the screen.]

6. a) What is a virtual image? Give an example.
[Hint: A virtual image is an image that cannot be obtained on a screen.
e.g. The image formed by a plane mirror.]

b) Write one use of a kaleidoscope.
[Hint: Kaleidoscopes are used by designers and artists to get ideas for new patterns.]

III. SHORT ANSWER TYPE QUESTIONS: (3M)

1. In what way is the word "AMBULANCE" painted in front of the hospital vans? Why is it painted in this way?
[Hint: The word AMBULANCE on the hospital vans is written in the form of its mirror image because any vehicle that is ahead of the ambulance van can see the laterally inverted alphabet correctly from its rear-view mirror and make way for it to pass through and enable it to reach the hospital quickly.]

2. What is a periscope, and mention its practical uses.

[Hint: A periscope is a simple device that allows you to see things that are hidden from direct view. It works by using two mirrors arranged at 45^0 angle to each other. The reflection from these mirrors allows us to see objects that are not directly visible.

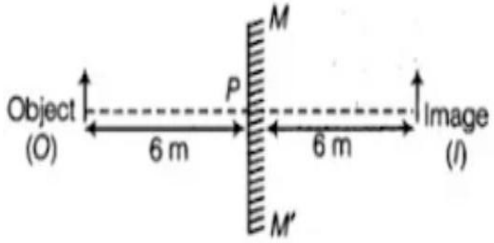
Practical uses of a periscope:
- Submarines use periscopes to see above water without surfacing.
- Soldiers use periscopes to observe enemy movements safely from bunkers or trenches.
- Useful in crowds to see over taller individuals.]

3. What is a plane mirror? State the four characteristics of the image formed by a plane mirror.
[Hint: A plane mirror is a flat, smooth, and shiny surface that reflects light. Common examples are bathroom mirrors or any flat glass mirror.

Characteristics of the image formed by a plane mirror.
The image formed is:
a) Upright and the same size as the object.
b) Virtual (cannot be obtained on a screen)
c) Laterally inverted (left becomes right and vice versa).
d) At the same distance behind the mirror as the object is in front of it.]

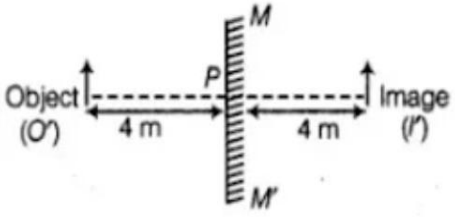
4. Explain why the Moon is considered a non-luminous object.
[Hint: The Moon is considered a non-luminous object because it does not produce its own light. Unlike the Sun, the Moon cannot generate light. Instead, it only reflects the sunlight that falls on its surface. That is why we can see the Moon—it shines with the reflected light of the Sun, not its own light.]

5. Assume a person is standing in front of a plane mirror(P). The distance between the mirror and his image (PI) is 6 m. If the person moves 2 m towards the plane mirror, what would be the distance between the person and his image?
[Hint:



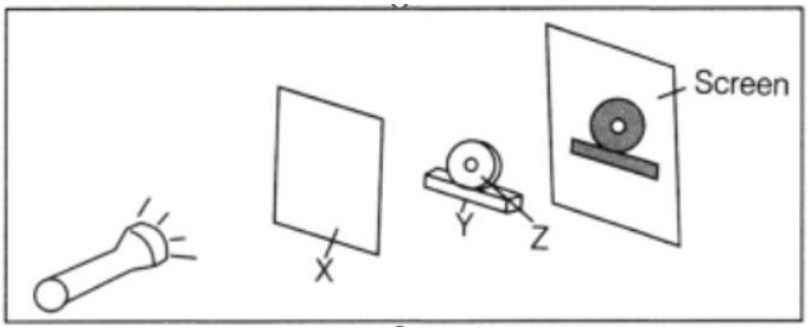
Since the image is 6m away from the plane mirror, it means that the object is also 6m away from the mirror. [Because PI (image distance) = OP (object distance)]

When the person moves 2 m towards the plane mirror
Distance between the person (object) and the plane mirror, i.e., OP = 6 m – 2 m
= 4 m.
This means that the distance between the image and the mirror, i.e., PI, will also be 4m.



Therefore, the new distance between the person and his image = 4 + 4
=8m.

6. a) Harsha wanted to test whether materials X, Y, or Z enabled light to pass through. He set up the experiment as shown below. When he showed a torch at the materials, he observed the following on the screen. Identify the properties of materials X, Y, and Z correctly.



[Hint: X: Transparent, Y & Z: Opaque]

b) You have to cast the shadow of your pencil on the wall with the help of a candle in a dark room. How can you obtain the shadow of the same size, small size and big size of the same pencil?

[Hint:

- The shadow of the pencil will be small when the pencil is taken close to the wall and away from the candle.
- The shadow will be bigger in size when the pencil is taken closer to the candle.
- To get the same-sized shadow as the pencil is, adjust the distance between the wall, pencil and candle at equal distances.]

IV. LONG ANSWER TYPE QUESTIONS: (5M)

1. What is a shadow? How does the shape, size and colour of an opaque object affect the shadow?

[Hint: A dark outline or patch formed by an opaque object that blocks light coming from a source of light is called a shadow.

The shape, size, and sharpness of the shadow depend on the position of the object relative to the light source and the screen. We cannot always identify an object exactly from its shadow. The shadow's shape changes with the position of the object and the light source. If the object is tilted, rotated, or kept at a different angle to the light, the shadow's shape will change.

Changing the colour of opaque objects does not change the colour of the shadows. The shadow is always black or dark, because no light reaches that area.]

V. SOURCE-BASED/ CASE STUDY-BASED QUESTIONS

Read the following passage and answer the questions.

A pinhole camera is a device in which the light rays from an object pass through a tiny hole (a pinhole) and form an image on a screen. A student made a pinhole camera and placed a burning candle in front of it. He noticed that the image formed was smaller and inverted. This is because light travels in a straight line, so the rays from the top of the candle reach the lower part of the screen and those from the bottom reach the upper part, producing an inverted image. A pinhole camera always forms a real, inverted, and smaller image. If the hole is made too large, too many light rays enter at once, causing the image to appear blurred.

i) What is a pinhole camera?
[Hint: A pinhole camera is a device in which the light rays from an object pass through a tiny hole (a pinhole) and form an image on a screen.]

ii) Why is the image inverted?
[Hint: Light travels in straight lines. The upper rays go to the lower part of the screen, and the lower rays go to the upper part, so the image becomes inverted.]

iii) What type of image is formed by a pinhole camera?
[Hint: A real, inverted, and smaller image.]

iv) What will happen if the hole is made too large?
[Hint: The image will become blurry or unclear because too many light rays enter.]

ANSWERS FOR OBJECTIVE TYPE QUESTIONS [1 to 10]:

1 – (c) The distance of the object from the mirror is equal to the distance of the image from the mirror.

2 – (d) Our right hand is the left hand of the image.

3 – (b) 2.5 m towards the mirror.

4 – (c) Reflection of light.

5 – (c) Light rays travel in straight lines.

6 – (b) Kaleidoscope.

7 – (b) 8 m

8 – (i) *Both A and R are true, and R is the correct explanation of the assertion.*

9 – (i) Both A and R are true, and R is the correct explanation of the assertion.

10 – (iii) A is true, but R is false.

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