



UNIQUE STUDY POINT

Light, Shadows and Reflections

EXERCISE

Question 1: Rearrange the boxes given below to make a sentence that helps us understand opaque objects.

OWS AKE OPAQ UE O BJEC T SM
SHAD

--	--	--	--	--	--

Answer:

OPAQ UE O BJEC T SM AKE SHAD OWS
OPAQUE OBJECTS MAKE SHADOWS

Question 2: Classify the objects or materials given below as opaque, transparent or translucent and luminous or non-luminous:

Air, water, a piece of rock, a sheet of aluminium, a mirror, a wooden board, a sheet of polythene, a CD, smoke, a sheet of plane glass, fog, a piece of red hot iron, an umbrella, a lighted fluorescent tube, a wall, a sheet of carbon paper, the flame of a gas burner, a sheet of cardboard, a lighted torch, a sheet of cellophane, a wire mesh, kerosene stove, sun, firefly, moon.

Answer:

Study Point

Opaque	Transparent	Translucent	Luminous	Non-luminous
a piece of rock	Air	A sheet of polythene	A lightened fluorescent tube	A mirror
a sheet of aluminium	Water	Fog	the flame of a gas burner	A piece of rock
A CD	A sheet of plane glass	A sheet of cellophane	a lighted torch	A wire mesh
Smoke			Firefly	Iron
Iron			Stove	A wall
An umbrella			Sun	
A wall			Moon	

Answer:

Question 3: Can you think of creating a shape that would give a circular shadow if held in one way and a rectangular shadow if held in another way?

Answer: Yes, a cylindrical shape is the one that would give a circular shadow if held in one way and a rectangular shadow if held in another way. Its circular ends will form a circular shadow when kept in the way of light whereas its curved sides will give rectangular shadow.

Question 4: In a completely dark room, if you hold up a mirror in front of you, will you see a reflection of yourself in the mirror?

Answer: No, to see the reflection, source of light is required. We can see only in the presence of light.

Or

An image is formed due to reflection of light by a plane mirror. In a completely dark room, there is no light present in the room. Thus, no reflection of light takes place by the mirror placed in the room. Hence, no image will get formed by a mirror in a completely dark room.

Extra Questions

Short Answer Type Questions

Question 1. Define luminous body.

Answer: The objects which emit light of their own are called luminous bodies, e.g., the sun, the stars, etc.

Question 2. What are luminous and non-luminous objects?

Answer: Luminous objects: Objects that give out or emit light of their own, e.g., sun, torch, light, bulbs, etc.

Non-luminous objects: Objects that do not give out light of their own, e.g., the moon, chair, shoe, pen, etc.

Question 3. Define opaque objects with example.

Answer: Those materials which do not allow light to pass through them, are called opaque objects. Examples wood, stone, etc.

Question 4. What are translucent objects?

Answer: Those objects which allow only a small part of the light rays to pass through them are called translucent objects. These are the objects through which one cannot see properly.

Question 5. What are transparent objects?

Answer: Those objects which allow light rays to pass through them completely are called transparent objects. One can see clearly through these objects.

Question 6. Classify the following into transparent, opaque and translucent objects:

Wax, spectacles, a heap of salt, a stone, dense smoke, wood, skin, balloon, rubber, membrane of a tabla, blood and milk.

Answer: Transparent objects are Spectacles.

Opaque objects are A stone, wood, a heap of salt, dense smoke, and membrane of tabla.

Translucent objects are Blood, milk, wax, skin, balloon, rubber.

Question 7. Close your eyes while looking towards bright sunshine. Now, cover the eyes with your palm still keeping them closed. Do you notice any difference? On the basis of this experience, state whether your eyelids are transparent, translucent or opaque.

Answer: On the basis of the experience, we observe our eyelids are opaque.

Question 8. Sometimes, you are able to see the Sun or the Moon behind the clouds. What can you say about the ability of such clouds to transmit light? '

Answer: We may say that clouds behave as translucent object.

Question 9. How will you convert a transparent glass sheet into a translucent sheet? Suggest any two ways to do it.

Answer:

- By smearing a thin layer of oil we may convert a transparent glass sheet into a translucent sheet.
- By covering one side of the glass sheet by butter paper.

Question 10. Name sources of light that are not hot.

Answer: Tube light, jugnu.

Question 11. List four natural sources of light.

Answer:

- Sun
- Stars
- Fire
- Jugnu (Firefly).

Question 12. Write down four man-made sources of light.

Answer:

- Candle
- Oil lamp
- Electric bulb
- Torch.

Question 13. Does the fire emit light?

Answer: Yes, fire emits light.

Question 14. On what factor does the proportion of light that enters an object depend?

Answer: Optical nature of the object.

Question 15. What is an obstacle?

Answer: An object which comes to the path of light is called an obstacle.

Question 16. Give examples of two substances through which light does not pass?

Answer: Wood and bricks are the substances through which light does not pass.

Question 17. Whether a shadow is two-dimensional or three-dimensional?

Answer: Shadow is not just the two-dimensional outline that you see on the ground. All the space behind the opaque object up to some distance behind it seems to be filled with the shadow

Question 18. What do we need in order to see a shadow?

Answer: We need the following in order to see a shadow

- a source of light,
- an opaque object in the way of light, and
- a screen;

Question 19. Does the direction of shadow change during the day? Does the length of shadow also change from season to season?

Answer: Yes, the direction of shadow changes as the sun changes its position during the day. The length of the shadow also changes from season to season.

Question 20. Define screen.

Answer: Screen is a surface on which images are formed.

Question 21. What is umbra and penumbra?

Answer: Umbra is the dark region behind object facing light which does not receive light at all. Penumbra is the less dark part of shadow. It is the outer part of shadow.

Question 22. Define pinhole camera.

Answer: It is a device which forms a photograph like image of a bright object on a screen.

Question 23. Why is the image formed in a pinhole camera inverted?

Answer: In a pinhole camera, image formed is inverted because the object is between radius of curvature and focus.

Question 24. What is the path of light?

Answer: Straight line.

Question 25. Define 'Mirror'.

Answer: A smooth shining surface, which rebounds the light back in same or in different direction is called a mirror.

Question 26. Why is silvered glass used as a mirror?

Answer: The silvered glass has a smooth surface and the smoothness helps in forming clear image. Silvering makes it shiny and the shiny surface helps in reducing the absorption.

Question 27. What happens when light falls on a mirror?

Answer: Mirror is silvered on one side, so it does not allow the light to pass through it. It reflects almost whole of the light falling on it.

Question 28. What change in the path of light takes place when light falls on a shiny surface? What is this called?

Answer: The light comes back in the same plan when light falls on a shiny surface. This is known as reflection of light.

Question 29. How are moon and planets visible to us, though they are not luminous?

Answer: Because they reflect light from the sun.

Question 30. What do you mean by scattering of light?

Answer: When a beam of light falls on a rough surface, it is turned back in different directions, it is called scattering of light.

Question 31. Why is the moon not considered as a luminous body?

Answer: Moon is a non-luminous body because it shines by reflecting the sunlight falling on it.

Long Answers Type Questions

Question 1. What is reflection?

Answer: When a ray of light falls on a smooth and shiny surface, the whole of light is sent back in the same medium. It is called reflection. Mirrors do not allow even a small amount of light to pass through them. Mirrors show regular and complete reflection.

Question 2. Why do we need a shiny surface for reflection?

Answer: The extent of reflection depends upon the shine and smoothness of the surface. More is the shine and smoothness of the surface, more will be the reflection. That is why mirrors reflect most of the light falling on it. Hence, for reflection, shiny surfaces are required.

Question 3. Can you think of a situation where we can see the path of the light?

Answer: In a dark room, we can see with torch light which goes straight. Similarly, dust particles become visible when light enters the room through fine hole.

All these examples indicate that light travels in straight line.

Question 4. What is a shadow? How is it formed? How does the colour of an opaque object affect the colour of the shadow?

Answer: A shadow is a dark outline or image cast by an opaque object that blocks light coming from a source of light. It is formed when light hits the opaque object which does not let the light pass through. Everywhere else around the opaque object, the light continues in a straight path

until it bounces off the ground or wall behind the object. The wall or ground behind the opaque object is the screen. On this screen is a dark patch, or shadow, with the same outline as the object surrounded by light. The colour of the opaque object does not affect the colour of the shadow that is formed.

Question 5. What is the difference between image and shadow?

Answer:

Image	Shadow
Image is formed due to reflection or refraction of light	Shadow is formed when light falls on the opaque body.
Image is seen when light coming from the object after reflection or refraction enters the observer's eye.	No light enters the eye from the shadow of the object.
Image gives more information such as colour, structure, etc., about the object	Shadow does not provide any detail about the object, it gives an idea about the shape of the object.

Question 6. Match the following items given in Column A with that in Column B:

Column A	Column B
(a) Transparent	(i) Region of absence of light
(b) Opaque	(ii) Scattering back of the light by shining surface
(c) Translucent	(iii) Object through which one can see clearly
(d) Luminous body	(iv) Object through which one cannot see at all
(e) Shadow	(v) Formed due to reflection by mirrors
(f) Image	(vi) Object through which we cannot see clearly
(g) Reflection	(vi) Phenomenon of changing left to right
(h) Lateral inversion	(vii) Produces light of its own

Answer:

Column A	Column B
(a) Transparent	(iii) Object through which one can see clearly
(b) Opaque	(iv) Object through which one cannot see at all
(c) Translucent	(vi) Object through which we cannot see clearly
(d) Luminous body	(viii) Produces light of its own

(e) Shadow	(i) Region of absence of light
(f) Image	(v) Formed due to reflection by mirrors
(g) Reflection	(ii) Scattering back of the light by shining surface
(h) Lateral inversion	(vii) Phenomenon of changing left to right

FOR MORE STUDY MATERIALS VISIT: WWW.UNIQUESTUDYONLINE.COM

JOIN US ON:

