



INDIAN SCHOOL AL WADI AL KABIR



<b>CLASS: VIII</b>	<b>DEPARTMENT: SCIENCE 2023-24</b>	<b>DATE: 09/11/2023</b>
<b>WORKSHEET NO: 11 WITH ANSWERS</b>	<b>TOPIC: LIGHT</b>	<b>NOTE: A4 FILE FORMAT</b>
<b>NAME OF THE STUDENT:</b>	<b>CLASS &amp; SEC:</b>	<b>ROLL NO.</b>

**I. OBJECTIVE-TYPE QUESTIONS:**

1. A student switched on a torchlight and pointed it towards a rough reflecting surface. What is likely to happen to the rays of light emitted from the torch?

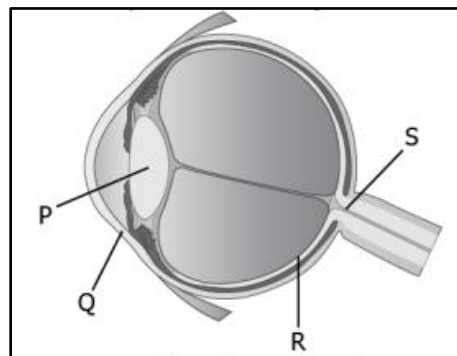
- a) Rays of light will get absorbed
- b) Scattering of the rays of light**
- c) Reflect back along the path of incidence
- d) Reflect in one particular direction depending on the angle of incidence

2. A student observes that using a kaleidoscope he was able to see several patterns in the tube. What causes the kaleidoscope to form these patterns?

- a) Repeated reflection of light**
- b) Thickness of the reflecting surface
- c) Roughness of the reflecting surface
- d) Enormous amount of light falling on a reflecting surface

3. The image represents the human eye. It marks a few parts of the eye as P, Q, R, and S.

Which marked part of the eye senses the colour of an object?



a) P

b) Q

c) R

d) S

4. A student studies that at the point where the optic nerve and the retina meet, there are no sensory cells. As a result, no vision is possible. Which of these marks the junction point of the optic nerve and the retina?

a) Iris

b) Cornea

c) **Blind spot**

d) Optic nerve

5. One evening while Sheetal and her friends were playing, some dust particles went into Sheetal's eye. Which step should be adopted to remove the dust from her eyes?

a) Rub eyes with fingers

b) Blow hot air into the eyes

c) **Wash eyes with clean water**

d) Wash eyes with any kind of detergents

6. A student studies that the braille system is a popular resource that can be used by visually challenged persons to communicate. It is a combination of dots to represent a character. Which sense is likely to help a person recognize a braille character?

a) hearing

b) smell

c) taste

d) **touch**

*For the questions that follow, 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.**

7. **Assertion (A):** We can see non-luminous objects around us.

**Reason (R):** Light emitted by the non-luminous object falls on the eye.

iii) **A is true but R is false.**

8. **Assertion (A):** Multiple images are formed when two plane mirrors are placed at an angle to each other.

**Reason (R):** The image formed by one mirror acts as the object for the second mirror.

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

9. **Assertion (A):** The image formed by a plane mirror is real at the surface of the mirror and enlarged.

**Reason (R):** The splitting of light into its constituent colours is known as dispersion.

**iv) A is false but R is true.**

10. **Assertion (A):** Visually challenged persons can read and write using a braille system.

**Reason (R):** The Owl has a large cornea and a large pupil to allow more light in its eye.

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

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

1. What is meant by lateral inversion? **[Hint- The phenomenon of the left side appearing right side and the right side appearing left side on reflection in a plane mirror is called lateral inversion.]**
2. What happens to light when it gets dispersed? Give an example.  
**[Hint- Light splits into its constituent colours, when it gets dispersed, e.g. Rainbow formation is due to the dispersion of white light after passing through water droplets which act as a prism.]**
3. How do eyelids protect our eyes? **[Hint- Eyelids prevent objects from entering the eye. They also shut out the light when not required.]**
4. Name the two kinds of cells in the human eye and state their functions.  
**[Hint- Rods- sensitive to dim light, and Cones- sensitive to bright light and colour.]**
5. What kind of lens is there in our eyes? Where does it form the image of an object?  
**[Hint- Convex lens. It forms the image of an object on the retina.]**
6. What is a blind spot? **[Hint- Blindspot is an area on the retina where the nerve endings enter the optic nerves. Since this area has no visual receptors such as rods and cones, the images falling on this area cannot be detected.]**
7. How many images of a candle will be formed if it is placed between two plane mirrors separated by an angle of  $45^\circ$ ?  
**[Hint- Number of images =  $(360/45) - 1 = 8-1 = 7$  images.]**
8. Give four characteristics of an image formed by a plane mirror.  
**[Hint- It is virtual, erect and of the same size as the object, the distance of the object from the plane mirror is the same as the distance of the image from the plane mirror and it is laterally inverted.]**

9. Distinguish between real and virtual images. **[Hint-Real image can be obtained on a screen and is inverted. A virtual image cannot be obtained on a screen and is always erect.]**
10. A Periscope is a device made by using two plane mirrors placed at particular angles.
- a) On which principle does it work? **[Multiple reflections of light.]**
- b) What is it used for? **[In submarines to see things above the surface of the water.]**
11. Eyes of the nocturnal birds have a large cornea and a large pupil. How does this structure help them? **[Hint- Eyes of the nocturnal birds having large corneas with wider pupils, can collect more ambient light which helps them to see objects even at night.]**
12. How do visually impaired people read? **[Hint- Braille is one of the several aids that has been created for visually impaired people. It makes use of raised dots that are placed in various regular patterns and they enable people to read and write using their hands.]**

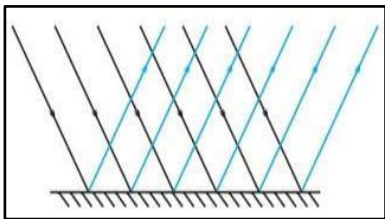
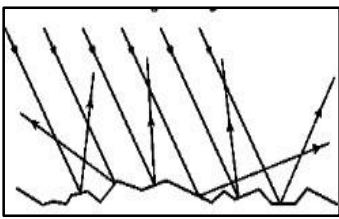
### **III. SHORT ANSWER TYPE QUESTIONS (3M):**

1. What is a cataract? How is it treated medically? **[Hint- In old age, eyesight becomes foggy because the eye lens becomes cloudy. When it happens, people are said to have cataracts. In extreme cases, it leads to loss of vision. It is treated surgically by removing the opaque lens and replacing it with a new artificial lens.]**
2. If an object is placed at a distance of 7.5 cm from a plane mirror, how far would it be from its image? **[The object would be 15cm far away from its image. The object is 7.5cm from the mirror, then the image of the object is 7.5cm on the other side of the mirror. Hence, the image is a total of 15cm from the object (7.5cm to the mirror + 7.5cm to the image.)**
3. What is a Kaleidoscope? On what principle does it work and also state its applications. **[Hint- Kaleidoscope is an instrument containing mirrors and pieces of coloured glass whose reflection produces changing patterns when it is rotated. It is based on the principle of multiple reflections of light. Applications are given below:**
- (i) It is used for decoration purposes, toys, etc. (ii) Kaleidoscope is also useful for designers and artists to get ideas for new patterns to design wallpapers, jewellery, and fabrics.]**

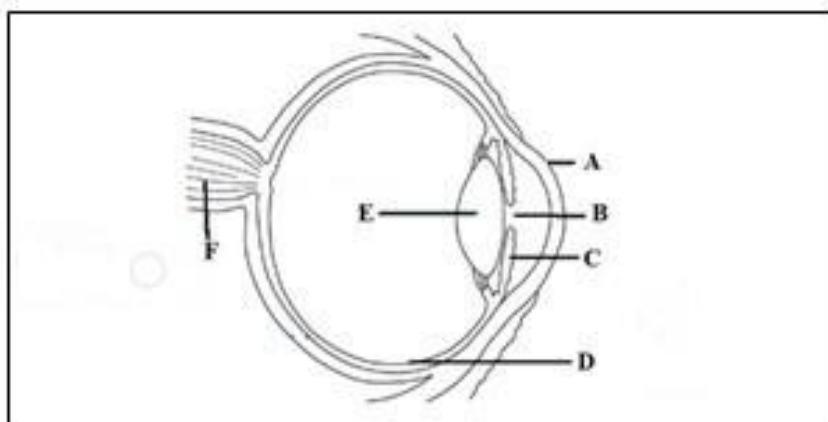
4. Explain the process which enables us to perceive motion in a cartoon film.

[Hint: We perceive motion in a film due to the persistence of vision. The impression of an image does not vanish immediately from the retina. It persists there for about  $1/16^{\text{th}}$  of a second. So, if still images of a moving object are flashed on the eye at a rate faster than 16 per second, then the eye perceives this object as moving. The movies that we see are several separate pictures in proper sequence. They are made to move across the eye usually at the rate of 24 pictures per second (faster than 16 per second). So, we see a moving picture.]

5. Draw and also state two points of difference between regular and diffused reflection.

REGULAR REFLECTION	DIFFUSED REFLECTION
Regular reflection takes place when the surface is smooth and highly polished.	Irregular reflection takes place when the surface is rough or uneven.
Image is formed due to regular reflection.	We can see things around us due to diffused or irregular reflection.
	

6. Label the parts in the given figure:



[Hint: A – Cornea, B – Pupil, C – Iris, D – Retina, E – Lens, F – Optic nerve]

#### **IV. LONG ANSWER TYPE QUESTIONS (5M):**

1. State the functions of the following parts of the human eye. a) Cornea b) Iris c) Pupil  
d) Retina

[Hint: **a) Cornea-** a transparent portion that protects the eyes and allows light to enter the eye.

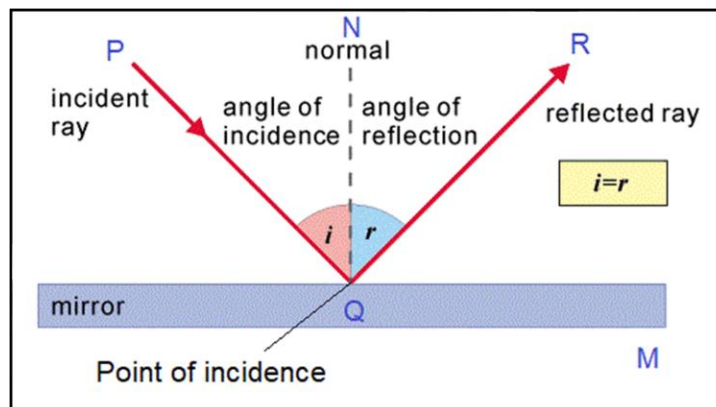
**b) Iris-** the coloured part of the eye behind the cornea. It regulates the amount of light entering the eye by adjusting the size of the pupil.

**c) Pupil-** In dim light, the iris makes the pupil enlarge to allow more light to enter the eye. In bright light, the iris makes the pupil contract, to reduce the amount of light entering the eye.

**d) Retina-** a delicate membrane just behind the eyeball. It acts as a screen on which an image is formed. It has light-sensitive receptors called rods and cones.]

2. Draw a neat labelled ray diagram to show the reflection of light from a plane mirror.

Explain all the terms related to the reflection of light.



- A light ray travelling from the source towards the mirror is called an incident ray.
- The light ray that bounces back from the mirror is called the reflected ray.
- The point at which the incident ray meets the mirror is called the point of incidence.
- The line drawn perpendicular to the surface of the mirror at the point of incidence is termed normal.
- The angle between the incident ray and the normal at the point of incidence forms the angle of incidence.

- The angle between the reflected ray and the normal at the point of incidence is known as the angle of reflection.

### V. CASE STUDY- BASED QUESTIONS/ PASSAGE BASED QUESTIONS:

1. The light ray that falls on a mirror is called the incident light ray. The ray that comes back from the surface after reflection is called the reflected light ray. The point where the incident ray strikes the reflecting surface is called the point of incidence. A line drawn perpendicular to the mirror at the point of incidence is normal. If the rays, after reflection from a surface, are parallel, then the reflection is termed regular reflection. The reflection from a plane mirror is an example of regular reflection. When parallel rays, after reflection from a surface, are not parallel, then it is called diffused reflection or irregular reflection. The reflection from an uneven surface is a diffused reflection.

*Note: Rules are applicable for plane surfaces as well as curved surfaces.*

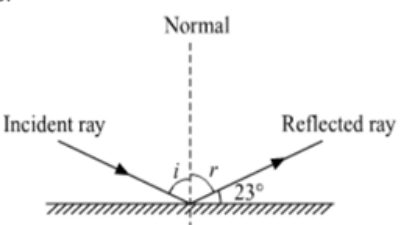
i) What is reflection? **[Hint-Bouncing back of light rays after hitting any surface is called reflection of light.]**

ii) State the laws of reflection of light. **[Hint: Laws of Reflection:**

**Law 1: The angle of incidence is always equal to the angle of reflection. i.e.  $\angle i = \angle r$ .**

**Law 2: The incidence ray, the reflected ray, and the normal at the point of incidence all lie in the same plane.]**

iii) If the angle between the mirror and the reflected ray is  $23^\circ$ , what is the angle of incidence of the incidence ray?

<p>b.</p> 	$\angle r + 23^\circ = 90^\circ$ $\Rightarrow \angle r = 67^\circ$ <p>Using law of reflection, we have</p> $\angle i = \angle r = 67^\circ$
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2. Amar and Dhaval had come to visit an ophthalmologist. On enquiring, it was found that Amar can read his book when he places it very near to his eyes, but his friend Dhaval can only see objects that are placed at a distance, not the ones placed nearby. When observed by a doctor it was found that Amar was suffering from short-sightedness which is a defect of vision wherein far-off objects appear blurred and objects near are seen clearly and

Dhaval was suffering from long-sightedness which is a defect of vision wherein there is difficulty in viewing objects that are near but one can view far objects easily.

Some old people suffer from cataracts which is the clouding of the lens that prevents the formation of a clear, sharp image. Because of this clouding blurred images are formed. Correction of cataracts can happen through surgery by placing an artificial lens in place of the opaque lens. They have very limited vision to see things. You must take proper care of your eyes. If there is any problem you should go to an eye specialist.

i) Identify the defect Amar is suffering from -

**a) Short-sightedness**

b) Cataract

c) Conjunctivitis

d) Long-sightedness

ii) Identify the defect Dhaval is suffering from -

a) Cataract

b) Short-sightedness

c) Conjunctivitis

**d) Long-sightedness**

iii) Why one should include vitamin A-rich eatables in their diet? **[Hint-Eating foods rich in vitamin A is important for maintaining our eyesight and our immune system.]**

iv) What are the main sources of vitamin A? **[Hint- Raw carrots, broccoli, and green vegetables (such as spinach) and cod liver oil are rich in vitamin A.]**

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