



## INDIAN SCHOOL AL WADI AL KABIR



<b>Class: VIII</b>	<b>Department: SCIENCE-2021-2022</b>	<b>Date of completion: 13.02.2022</b>
<b>Worksheet No:15 with answers</b>	<b>Topic: LIGHT</b>	<b>Note: A4 FILE FORMAT</b>
<b>NAME OF THE STUDENT</b>	<b>CLASS / SECTION</b>	<b>ROLL NO.</b>

### I. VERY SHORT ANSWER (1M):

1. What is meant by lateral inversion? [Hint- Lateral inversion is the phenomenon of the interchange of the left and right sides, between the object and its image.]
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? [Hint-The object would be 15cm far away from its image if it is placed at a distance of 7.5cm from the plane mirror. The object is at 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 object (7.5cm to the mirror + 7.5cm to the image).]
3. What would you do to see if the barber has cut your hair properly at the back? [Hint- I would keep another mirror at a certain angle to the main mirror in a vertical position.]
4. 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 acts as a prism.]
5. How many images of a candle will be formed if it is placed between two plane mirrors separated by an angle of  $40^\circ$ ? [Hint- Number of images =  $(360/40) - 1 = 9 - 1 = 8$  images.]
6. How do eyelids protect our eyes? [Hint- Eyelids prevent the objects from entering the eye. They also shut out light when not required.]
7. Name the part of the eye which gives colour to the eyes. [Hint- Iris is the part of the eye which gives its distinctive colour.]
8. What kind of lens is there in our eyes? Where does it form the image of an object? [Hint- Convex lens is present in our eyes, which focuses light on the back of the eye, on a layer called retina. So, it forms the image of an object at retina.]
9. What is a blind spot? [Hint- At the junction of the optic nerve and the retina, there are no sensory cells, so no vision is possible at that spot. This is called the blind spot.]
10. Name the two kinds of cells in the human eye and state their functions. [Hint- Rods- sensitive to dim light, Cones- sensitive to bright light.]

*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 assertion.*

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

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

*iv) A is false but R is true*

11. 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 assertion.**

12. 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.**

13. Assertion (A): Lack of vitamin A in foodstuff is responsible for many eye troubles.

Reason (R): Raw carrots, broccoli and green vegetables are rich in vitamin A.

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

## **II. CASE STUDY BASED QUESTIONS:**

Ajith and Dipu had come to visit an ophthalmologist. On enquiring, it was found that Ajith can read his book when he places it very near to his eyes, but his friend Dipu can only see objects which are placed at a distance, but not the ones placed nearby.

When observed by doctor it was found that Ajith was suffering from short sightedness which is a defect of vision wherein far-off objects appear blurred and objects near are seen clearly and Dipu 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 cataract 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 cataract can happen through a surgery by placing an artificial lens in place of the opaque lens. Some persons, including children, can be visually handicapped. They have very limited vision to see things. The most popular resource for visually challenged persons is known as Braille.

i) The defect of eye in which the lens of the eyes becomes cloudy is-

- (a) Shortsightedness
- (b) Long sightedness
- (c) Astigmatism
- (d) Cataract**

ii) Identify the defect Ajith is suffering from.

- (a) Cataract
- (b) Conjunctivitis
- (c) Short sightedness**
- (d) Long sightedness

iii) Visually impaired people can read and write using:

- (a) electronic writer

- (b) digital pens
- (c) braille system
- (d) hearing aids

iv) Identify the defect Dipu is suffering from.

- (a) Cataract
- (b) Conjunctivitis
- (c) Short sightedness
- (d) Long sightedness

### **III. PASSAGE BASED QUESTIONS:**

To see an object, its image must be formed on the retina by the eye lens. As soon as the object is removed, the image disappears but the brain remembers the image for  $1/16^{\text{th}}$  of a second even after the removal of the object. This effect is called persistence of vision. As a result, we continue to see the object for  $1/16^{\text{th}}$  of a second longer even when the object is not in front of our eyes.

This phenomenon is utilised in making motion pictures. The movies that we see are actually a number of 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. Before the brain has forgotten the first image, the second, third and fourth are projected and they merge as a single moving object.

i) In human eye image is formed:

- (a) Behind retina
- (b) In front of retina
- (c) On retina
- (d) In between lens and retina

ii) The persistence of vision for the human eye is:

- (a)  $1/6^{\text{th}}$  of a second
- (b)  $1/10^{\text{th}}$  of a second
- (c)  $1/16^{\text{th}}$  of a second
- (d)  $1/18^{\text{th}}$  of a second

iii) Persistence of vision is the principle behind?

- (a) Camera
- (b) Spectroscope
- (c) Cinema
- (d) Periscope

iv) At what rate are the still pictures projected in proper sequence on the screen in a movie hall.

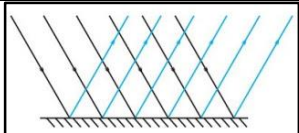
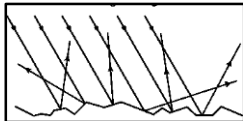
- (a) 10 per second
- (b) 24 per second.
- (c) 1 per second
- (d) 5 per second

**IV. a) SHORT ANSWER TYPE QUESTIONS (2 M):**

1. Give four properties of the image of an object formed by a plane mirror. [Hint- The properties of the image formed by a plane mirror- a) The image is formed as far behind the mirror as the object is in front of it. b) The image formed is a virtual image. c) The image formed is an erect image and of the same size as the object. d) The image formed is laterally inverted with respect to the object.]
2. Distinguish between real and virtual images. [Hint- The real image can be obtained on a screen and is inverted. The virtual image cannot be obtained on a screen and is always erect.]
3. What is cataract? How is it treated medically? [Hint- In old age, eyesight becomes foggy because eye lens become cloudy. When it happens, people are said to have cataract. 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.]
4. Explain the process which enables us to perceive motion in a cartoon film. [Hint- In a cartoon film, we see the projection of static pictures on the screen in a specific order. Generally, the static pictures are made to move across the eye in a sequence at the rate of 24 pictures per second (faster than 16 per second) giving us the perception of a moving picture.]
5. Eyes of the nocturnal birds have a large cornea and a large pupil. How does this structure help them? [Hint- The size of the eyes of a nocturnal bird is large. Eyes of the nocturnal birds having large cornea with a wider pupil, can collect more ambient light which helps them to see the objects even at night.]
6. How do visually impaired people read? [Hint- Braille is one of the several aids that has been created for the 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.]
7. A Periscope is a device made by using two plane mirrors placed at particular angles.
  - a) On which principle does it work? [Multiple reflection of light.]
  - b) What is it used for? [Hint-In submarines to see things above the surface of the water.]

**IV. b) SHORT ANSWER TYPE QUESTIONS (3 M):**

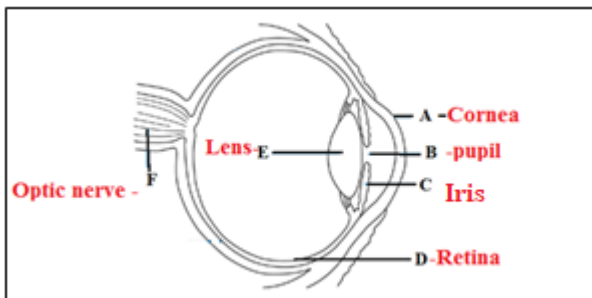
1. Draw and also state two points of difference between regular and diffused reflection.

<b>REGULAR REFLECTION</b>	<b>DIFFUSED REFLECTION</b>
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 this type of reflection.	We can see things around us due to diffused or irregular reflection.
	

2. 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 reflection of light. Applications are given below:

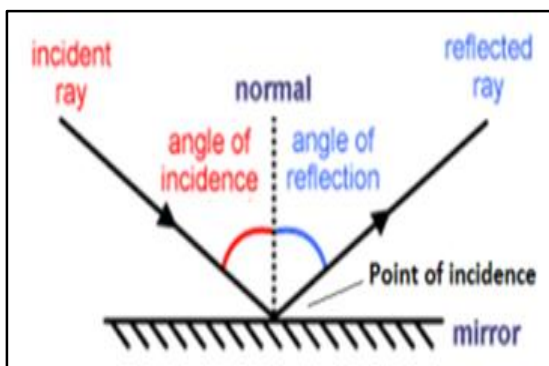
(i) It is used for decoration purposes, toys, etc. (ii) Kaleidoscope is also useful for designers and artists to get ideas for new patterns to design wallpapers, jewellery and fabrics.]

3. Label the parts in the given figure.



### V.LONG ANSWER TYPE QUESTIONS (5 M):

1. Draw a neat labelled ray diagram to show reflection of light from a plane mirror. Explain all the terms related to reflection of light.



- A light ray travelling from source towards the mirror is called as 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 as the 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 angle of reflection.

2. State the functions of the following parts in the human eye.

[a) Cornea- is a transparent portion which protects the eyes and allows light to enter the eye.

b) Iris- is 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- is 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.]

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