



INDIAN SCHOOL AL WADI AL KABIR

Class: VIII	Department: SCIENCE-2020-2021	Date of completion: 29 th Nov, 2020
Worksheet No:13 with answers	Topic: LIGHT	Note: A4 FILE FORMAT

I. OBJECTIVE TYPE QUESTIONS-

Tick the correct option for the following-

- Which of the following statement is correct?
(a) Cones are sensitive to dim light. (b) Cones are sensitive to bright light.
(c) Rods are sensitive to bright light. (d) Rods can sense colour.
- The defect of eye in which the lens of the eyes becomes cloudy is-
(a) Shortsightedness (b) Long sightedness (c) Astigmatism (d) Cataract
- The phenomenon of the splitting of white light into seven colours is called as
(a) dispersion (b) refraction (c) reflection (d) deviation
- The blind spot of the eye is-
(a) at the junction of optic nerve and retina (b) on one side of optic nerve
(c) on one side of retina (d) in the centre of retina
- Part of the eye which controls the entering of light is called
(a) iris (b) cornea (c) lens (d) retina
- 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.
- For two plane mirrors facing each other, the number of images formed are
(a) 20 (b) 10 (c) zero (d) infinite

For the following questions, two statements are given- one labeled Assertion (A) and the other labeled 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 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): 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 correct explanation of the assertion.

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

Reason (R): Light emitted by the object falls on the eye.

iii) A is true but R is false.

10. 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 the assertion.

II. BASIC CONCEPTS LEVEL QUESTIONS:

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. Distinguish between real and virtual image. [Hint- The real image can be obtained on a screen. The virtual image cannot be obtained on a screen.]

3. 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 same size of the object. d) The image formed is laterally inverted with respect to the object.]

4. What would you do to see if the barber has cut your hair properly at the back?

[Hint- I would keep another mirror parallel to the main mirror in a vertical position.]

5. 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.]

6. What is a Kaleidoscope? On which principle does it work? [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.]

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.]

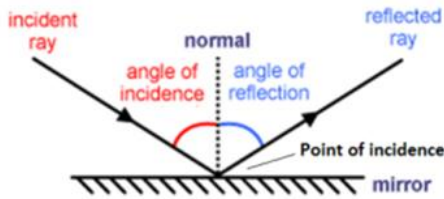
9. What is a blind spot? [Hint- At the junction of the optic nerve and the retina, there are no sensory cells, so no vision is possible at that spot. This is called the blind spot.]

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.]

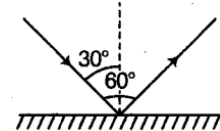
11. What is cataract? How is it treated medically? [Hint- In old age, eyesight becomes foggy because eye lens become cloudy. When it happens, persons are said to have cataract. In extreme cases it leads to loss of vision. It is treated surgically by removing the opaque lens and replacing it with new artificial lens.]

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



III. INTERMEDIATE LEVEL QUESTIONS:

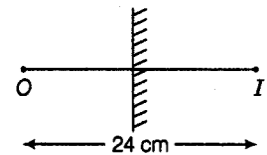
1. The angle between incident ray and reflected ray is 60° . What is the value of angle of incidence? [Hint-Since, angle of incidence = angle of reflection. So, angle of incidence = 30°]



2. What are the applications of a kaleidoscope? [Hint- Applications are given below:

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

3. The distance between the object and its image formed by a plane mirror appears to be 24 cm. What is the distance between the mirror and the object? [Hint- In case of plane mirror, the image formed is at the same distance behind the mirror as the object in front of it. Object distance from the mirror = image distance from the mirror. So, distance between the mirror and the object = 12 cm]



4. How do eyelids protect our eyes?

[Hint- Eyelids prevent the objects from entering the eye. They also shut out light when not required.]

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

a) Cornea- is 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 image is formed. It has light sensitive receptors called rods and cones.]

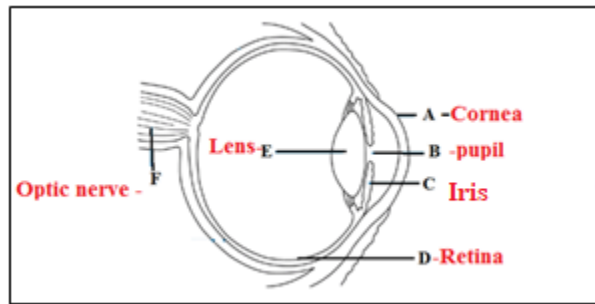
6. Eyes of the nocturnal birds have large cornea and a large pupil. How does this structure help them? [Hint- The size of the eyes of nocturnal bird is large. Eyes of the nocturnal birds having large cornea with a wider pupil, can collect more ambient light which help them to see the objects even at night.]

7. 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.]

8. 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.]

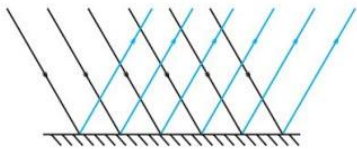
9. Label the parts in the given figure.



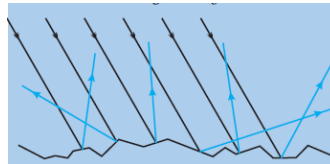
10. How many images of a candle will be formed if it is placed between two plane mirrors separated by an angle of 40° ? [Hint- Number of images = $360/40 - 1 = 9 - 1 = 8$]

11. Draw neat diagrams of regular and diffused reflection.

REGULAR REFLECTION

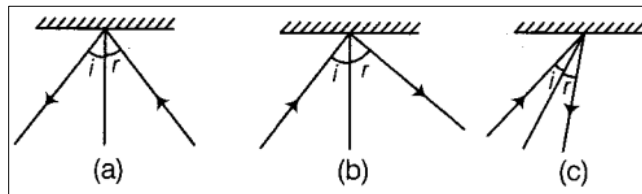


DIFFUSED REFLECTION

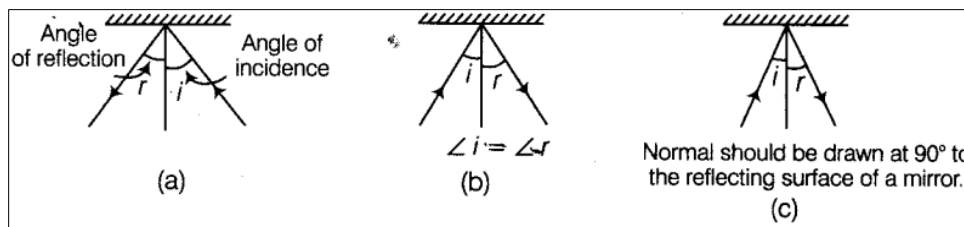


IV. ADVANCED LEVEL QUESTIONS:

1. There is a mistake in, each of the following ray diagrams given as Fig. (a), (b) and (c). Make the necessary correction(s).



Hint-

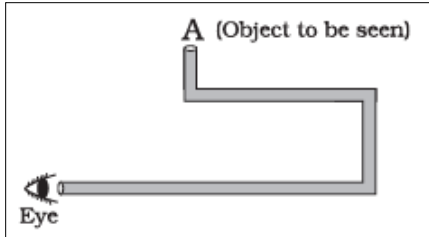


2. Ajith can read from his book when he places it very near his eyes, but his friend Dipu can see objects placed at a distance, but not the ones placed nearby. What could be their problem? [Hint- Ajith is suffering from short sightedness and Dipu from long sightedness.]

3. 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.]

V. EXEMPLAR QUESTIONS:

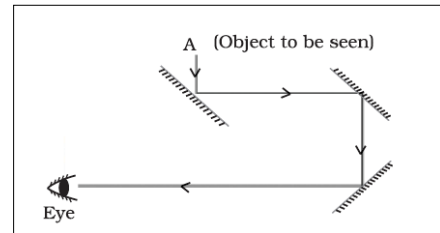


1. Boojho planned an activity to observe an object A through pipes as shown, so that he could see objects which he could not directly see.

- a) How many mirrors should he use to see the objects?
 [Hint-He should use three plane mirrors to see the objects.]
 b) Indicate the positions of the mirrors in the figure.

- c) Indicate the direction of rays in the figure.
 d) What must be the angle with respect to the incident light at which he should place the mirrors?

[Hint-Mirrors should be placed at an angle of 45° with respect to the incident light. So, that the rays can move forward.]



- e) If any of the mirrors is removed, will he be able to see the objects?

[Hint- He will not be able to see the objects if any of the mirrors is removed, because he will not get the reflected rays to move forward for further reflection to reach our eyes.]

2. Boojho while waving his hand very fast in front of his eyes, observes that his fingers appear blurred. What could be the reason for it?

[Hint- The impression of an image persists for about $1/16$ th of a second on the retina. This is known as persistence of vision. 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.

So, in this case by waving hand very fast in front of eyes, the rate of movement of hand becomes very large (much faster than 16 per second), therefore, the fingers appear blurred.]

PREPARED BY: Mrs. Leena Chaudhary	CHECKED BY : HOD - SCIENCE
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