

SCIENCE
WORKSHEET 14022
CHAPTER 13 LIGHT (ANSWERS)

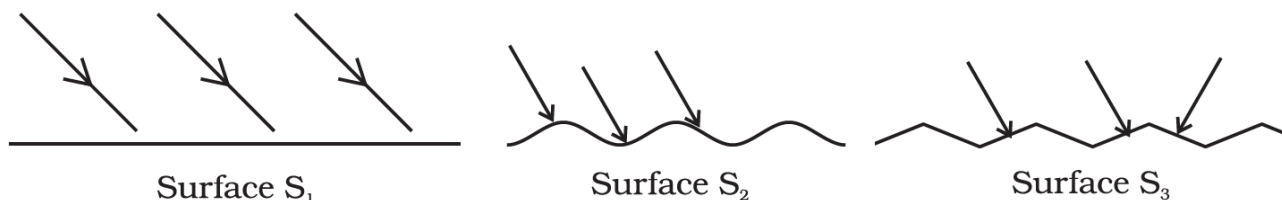
SUBJECT: SCIENCE
CLASS : VIII

MAX. MARKS : 40
DURATION : $1\frac{1}{2}$ hr

SECTION – A

Questions 1 to 6 carry 1 mark each.

1. Light is falling on surface S_1 , S_2 , S_3 as shown in below figure:



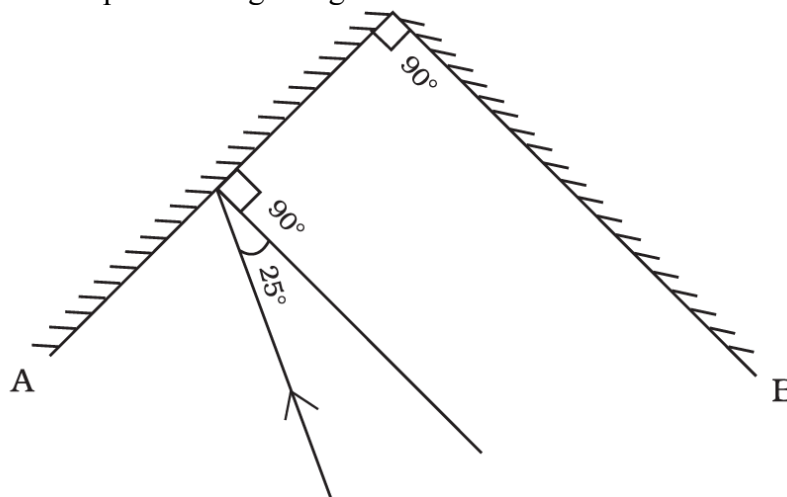
Surfaces on which the angle of incidence is equal to the angle of reflection is/are

- (a) S_1 only
- (b) S_1 and S_2 only
- (c) S_2 and S_3
- (d) all the three surfaces

Ans. (d) all the three surfaces

Laws of reflection are always followed irrespective of the surface of the object hence the angle of incidence is equal to the angle of reflection.

2. Two mirrors A and B are placed at right angles to each other as shown in



A ray of light incident on mirror A at an angle of 25° falls on mirror B after reflection. The angle of reflection for the ray reflected from mirror B would be

- (a) 25°
- (b) 50°
- (c) 65°
- (d) 115°

Ans. (c) 65°

The angle of reflection for the ray reflected from mirror B will be 65° because reflected ray from mirror A forms incident ray on mirror B and then reflected back by an angle of 65° .

3. Which of the following statements is correct regarding rods and cones in the human eye?

- (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.

Ans. (b) Cones are sensitive to bright light.

Cones are sensitive to bright light hence they sense the colour whereas rods are sensitive to dim light and they cannot sense colour.

4. The image formed by plane mirror is

(a) real and inverted (b) real and erect
(c) virtual and inverted (d) virtual and erect.

Ans. (d) virtual and erect.

5. What are the special features in owls eye that help it to see clearly in night.

(a) Large cornea, large pupil and more rods
(b) Large pupil, more rods
(c) Small cornea, large pupil and more rods
(d) Large cornea, less rods

Ans. (a) Large cornea, large pupil and more rods

A night bird (owl) can see very well in the night but not during the day. The owl has a large cornea and a large pupil to allow more light in its eye. Also, it has on its retina a large number of rods and only a few cones.

6. In the below question, a statement of Assertion (A) is followed by a statement of Reason (R). Mark the correct choice as

Assertion (A): Diffused reflection is caused due to irregular surface.

Reason (B): Diffused reflection is due to failure of laws of reflection.

(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
(b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A)
(c) Assertion (A) is true but reason (R) is false.
(d) Assertion (A) is false but reason (R) is true.

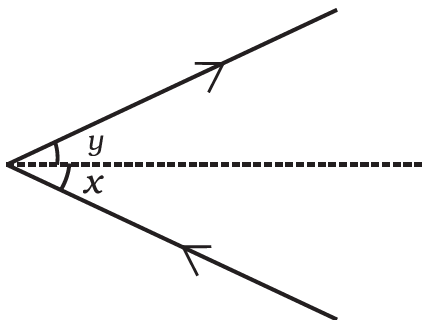
Ans. (c) Assertion (A) is true but reason (R) is false.

The diffused reflection is not due to the failure of the laws of reflection. It is caused by the irregularities in the reflecting surface, like that of a cardboard.

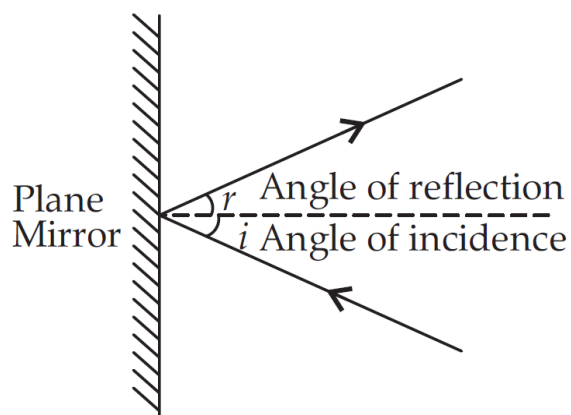
SECTION – B

Questions 7 to 10 carry 2 marks each.

7. Draw the below figure showing the position of the plane mirror. Also label the angle of incidence and angle of reflection on it.



Ans.



8. What is lateral inversion?

Ans. In an image formed by a mirror, the leftside of the object appears on the right and the right appears on the left. This is known as lateral inversion.

9. How do we get numerous beautiful patterns in a kaleidoscope?

Ans. Large number of images are formed by mirrors placed at an angle to one another. This phenomena of number of images formed by mirrors placed at an angle to one another is used in a kaleidoscope to make numerous beautiful patterns.

10. Which part of the eye gets affected if someone is suffering from cataract? How is it treated?

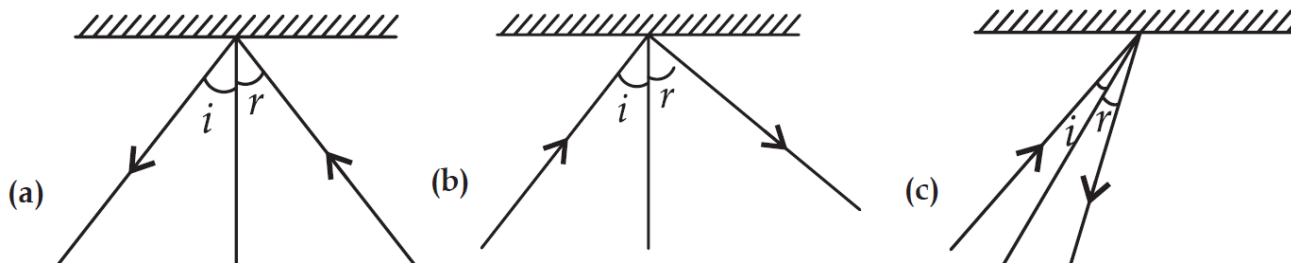
Ans. A cataract is a clouding of the lens in the eye that affects vision. It can be treated by surgically removing the cloudy lens and placing a new lens.

SECTION – C

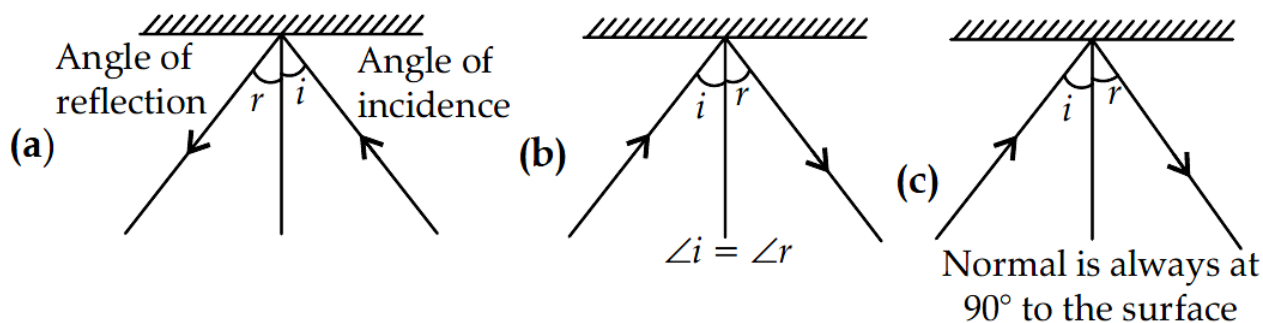
Questions 11 to 14 carry 3 marks each.

11. There is a mistake in each of the following ray diagrams given as below figure a, b, and c.

Make the necessary correction (s).



Ans.



12. What are the characteristics of image formed by plane mirror?

Ans. Characteristics of image formed by a plane mirror are:

(i) Plane mirror forms virtual images.

- (ii) Plane mirror forms erect images.
- (iii) Image is laterally inverted.
- (iv) Image formed is of the same size as the object.
- (v) The distance of image from the mirror is equal to the distance of object from the mirror.

13. Which disease of eye is caused by nutritional deficiency? Which nutrient should be added in the diet for healthy eyes? Which food items contain this nutrient?

Ans. Night Blindness is caused due to deficiency of Vitamin A in diet. Vit A should be incorporated in diet for healthy eyes. Raw carrots, broccoli and green vegetables (such as spinach) and cod liver oil are rich in vitamin A. Eggs, curd, cheese, butter and fruits such as papaya and mango are also rich in vitamin A.

14. Differentiate between Optical and Non-Optical Aids.

Ans. Optical Aids: Optical aids can help a person who is partially visually challenged. These aids enlarge an image or a text so that they could be visible. TV monitors, magnifying devices and telescopic devices come under this category.

Non-optical Aids: Non-optical aids are helpful for a person who is completely visually challenged. These aids rely on the senses of hearing and touch. Aids which rely on the sense of touch are called tactual aids. Braille script falls under this category.

SECTION – D

Questions 15 to 16 carry 5 marks each.

15. What is Braille system? Explain.

Ans. Braille is a method of writing for visually impaired person. This system was invented by Louis Braille in 1821 and adopted in 1932. He was also a blind person. In this method text is written on a thick paper using special symbols representing the letters of alphabet.

Groups of dots are employed to write letters. There is Braille code for common languages, Mathematics and Scientific notation. Braille system has 63 dots patterns. Each pattern represents a letter, a combination of letters, a common word or a grammatical sign.

Dots are arranged in cells of two vertical rows of three dots each. Codes of music and mathematics are different. Any language can be read through the codes of Braille.

Example of dot patterns used in Braille System is shown below:

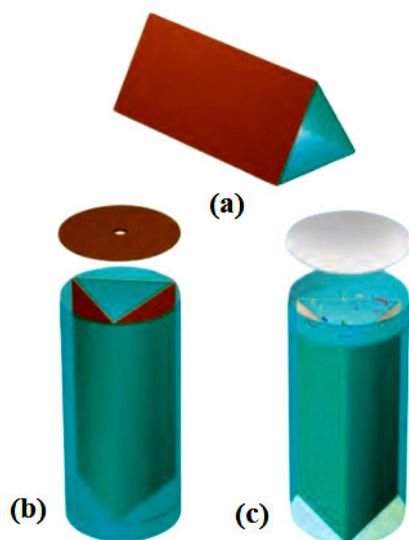
C	A	T	
●● — —	●— — —	—● ●● ●—	= CAT
and , (comma)			
●● ●— ●●	— — ●●		

OR

Describe the construction of a kaleidoscope.

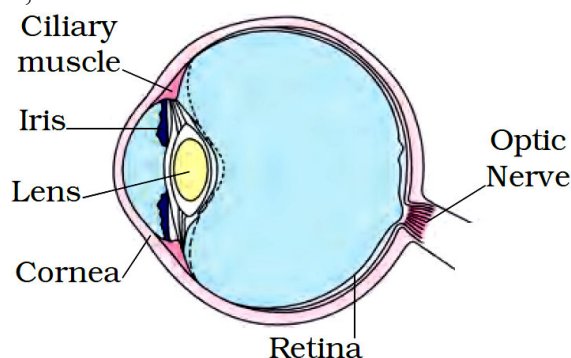
Ans. To make a Kaleidoscope, take three rectangular mirror strips each about 15 cm long and 4 cm wide. Join them together to form a prism. Fix this arrangement of mirrors in circular cardboard tube.

Make sure that the tube is slightly longer than the mirror strips. Close one end of the tube by a cardboard disc having a hole in the centre. To make the disc durable, paste a piece of transparent plastic sheet under the cardboard disc. At the other end, touching the mirrors, fix a circular plane glass plate. On this glass plate, place several small pieces of coloured glass. Now close this end of the tube by a ground glass plate. Now, your kaleidoscope is ready.



16. Explain the structure and working of a human eye.

Ans. The eye has a roughly spherical shape. The outer coat of the eye is white. It is tough so that it can protect the interior of the eye from accident. Its transparent front part is called cornea. Behind the cornea, we find a dark muscular structure called iris. In the iris, there is a small opening called pupil. The size of the pupil is controlled by the iris. The iris controls the amount of light entering into the eye. Behind the pupil of the eye is a lens which is thicker at the centre. The lens focuses light on the retina. The retina contains several nerve cells. Sensations felt by the nerve cells are then transmitted to the brain through the optic nerves. There are two kinds of cells; cones and rods.



SECTION – E (Case Study Based Question)

Question 17 carry 4 mark

17. Have you ever thought how we see various objects? You may say that eyes see the objects. But, can you see an object in the dark? It means that eyes alone cannot see any object. It is only when light from an object enters our eyes that we see the object. The light may have been emitted by the object, or may have been reflected by it. A polished or a shiny surface can act as a mirror. A mirror changes the direction of light that falls on it. After striking the mirror, the ray of light is reflected in another direction.



- (a) What do you mean by reflection of light? (1)
- (b) Define incident angle. (1)
- (c) What is the difference between regular reflection and diffused reflection? (2)

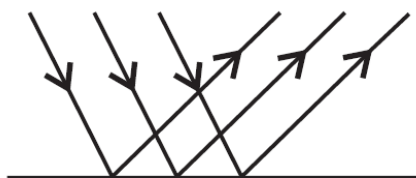
OR

State two laws of reflection of light.

Ans. (a) The bouncing back of light in the same direction after striking a smooth, polished surface.

(b) The angle between the normal and incident ray is called the angle of incidence.

(c) The reflection from a smooth polished surface like that of a mirror is called regular reflection. In this type of reflection, all the reflected rays are parallel as shown in figure



Regular surface

However, In case of diffused or irregular reflection, the rays are reflected from a rough or irregular surface and are not parallel as shown in figure.



Irregular surface

OR

Two laws of reflection of light are:

(i) Angle of incidence is always equal to the angle of reflection.

(ii) The incident ray, the normal at the point of incidence and the reflected ray all lie in the same plane.

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