16. REFLECTION OF LIGHT

Q 1) Fill in the blanks.

1. The perpendicular to the mirror at the point of incidence is called .....

Ans. Normal

2. The reflection of light from a wooden surface is ..... reflection.

Ans. Irregular

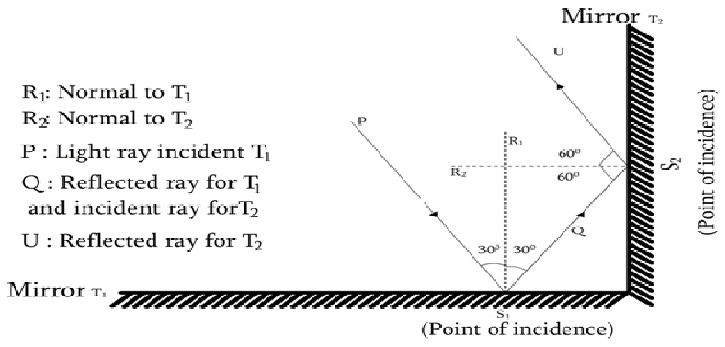
3. The working of kaleidoscope is based on the properties of ..... .

Ans. Reflection of light

Q 2) Draw a figure describing the following.

The reflecting surfaces of two mirrors make an angle of 90^o with each other. If a ray incident of one mirror has an angle of incidence of 30^o, draw the ray reflected from the second mirror. What will be its angle of reflection?

Ans.



From the figure, MSN = 30^o

$\angle$TSN = $\angle$MSN = 30^o (angle of incidence = angle of Reflection)

LT is normal to mirror B.

$\angle$QTL = 90^o

Sinde $\angle$QR, $\angle$QTS = TSN = 30^o (alternate interior angels)

Also $\angle$QTL = $\angle$QTS + $\angle$STL

$90^o = 30^o + \angle$STL

$\therefore \angle$STL = 90 - 30 = 60

$\angle$STL = $\angle$LTK (angle of incidence = angle of reflection)

$\therefore \angle$LTK = 60^o

$\therefore$ Angle of reflection = 60^o

Q 3) How will you explain the statement 'We cannot see the objects in a dark room'.

Ans. In a completely dark room no light will fall on the objects. Also no light will enter in our eyes. There will be no sensation of vision, and thus we will be unable to see objects in the room.

Q 4) Explain the difference between regular and irregular reflection of light.

Regular reflection	Irregular reflection
1. Reflection that occurs from a smooth surface is called regular reflection.	1. Reflection that occurs from a rough surface is called irregular reflection.
2. When parallel incident rays reflect on a smooth surface, the reflected rays remain parallel too.	2. When parallel incident rays, reflect on a rough surface, the reflected rays are not parallel because they get scattered.
3. When the incident rays are parallel, the angle of incidence made by all the rays with the normal are equal.	3. When incident rays are parallel, the angle of incidence made by the rays with the normal rays are not equal.
4. When incident rays are parallel, the angle of reflection which is made by all rays with the normal are same in measure.	4. When the incident rays are parallel, the angle of reflection made by all rays with the normal rays are not of equal measure.
5. The reflection which is seen on mirror is regular reflection	5. The reflection visible in running water is an irregular reflection.

Q 5) Draw a figure showing the following.

a. Incident Ray

b. Normal

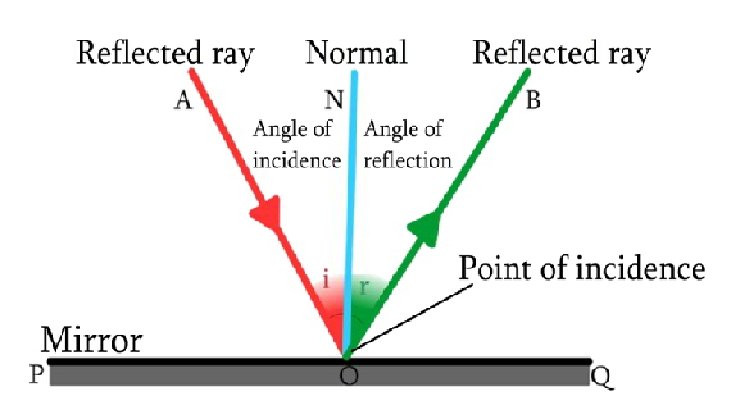
c. Angle of incidence

d. Angle of reflection

e. Point of incidence

f. Reflected ray

Ans.



Ray AO: Incident ray

Ray ON: Normal

∠AON: Angle of incidence

∠BON: Angle of reflection

Point O: Point of incidence

Ray OB: Reflected ray

Q 6) Study the following incident.

Swara and Yash were looking in a water filled vessel. They could see their images clearly in the still water. At that instant, Yash threw a stone in the water. Now their images were blurred. Swara could not understand the reason for the blurring of the images.

Explain the reason for blurring of the images to Swara by answering the following question.

i. Is there a relation between the reflection of light and the blurring of the images?

Ans. 1) Yes, there is a relation between the reflection of light and the blurring of the images. 2) When reflection occurs through smooth and shining surface we get clear images. 3) When Yash threw a stone in the water the surface of water becomes rough because of ripples formed by stone and thus images become blur.

ii. Which types of reflection of light can you notice from this?

Ans. 1) We can see two types of reflection from this incident. 2) When the water was still, water reflection is regular and when stone was thrown reflection is irregular.

iii. Are laws of reflection followed in these types of reflections?

Ans. Yes, laws of reflection are followed in these types of reflection.

Q 7) Solve the following examples.

a. If the angle between the plane mirror and the incident ray is 40^o, what are the angles of incidence and reflection?

Ans. Angle between plane mirror and incident ray = 40^o

To find: Angles of incidence and reflection

Angle of reflection r = the reflected ray and the normal is the angel of reflection

$$= 90^o - 40^o$$

$$= 50^o$$

∴ Angle of incidence i = r = 50^o

b. If the angle between the mirror and reflected ray is 23^o, what is the angle of incidence of the incident ray.

Ans. Angle between mirror and reflected ray =23^o

To find: Angles of incidence

Angle of reflection r = the incident ray and the normal is the angel of incidence

$= 90^o - 23^o$

$\therefore r = 67^o$

$\therefore$ Angle of Incidence i = r = 67^o

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