16. Reflection of Light

Practice Questions

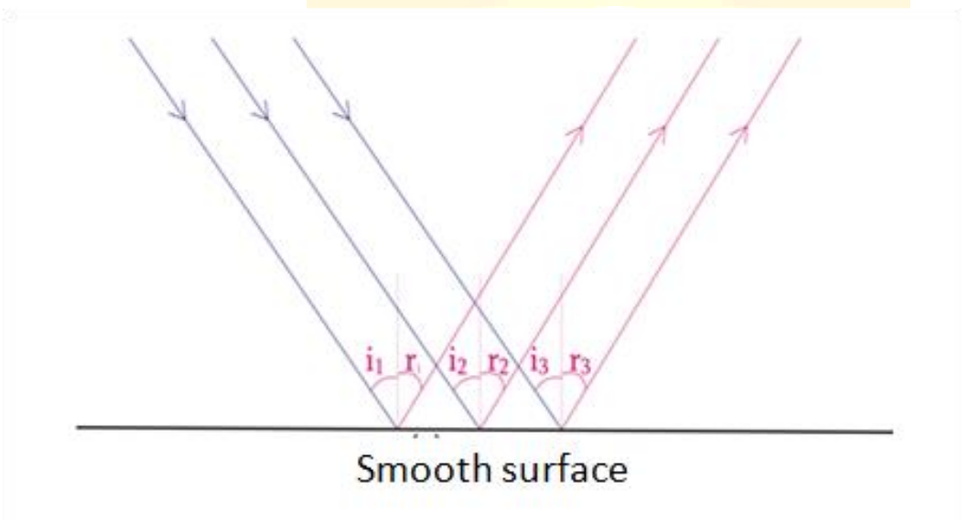
Q 1) Write short notes:

1. Periscope

Ans: Make slits in the top and bottom sides of the box and place the two mirrors so that they make an angle of 45⁰ with the sides of the box and are parallel to each other. Fix them with tape. Make two windows of 1 inch each near the two mirrors. Now see the objects through the bottom window. This device is called a periscope. It is used in submarines to see objects above the surface of water. It is also used to observe and keep a watch on the objects or people on the ground from an underground bunker.

2. Regular reflection of light

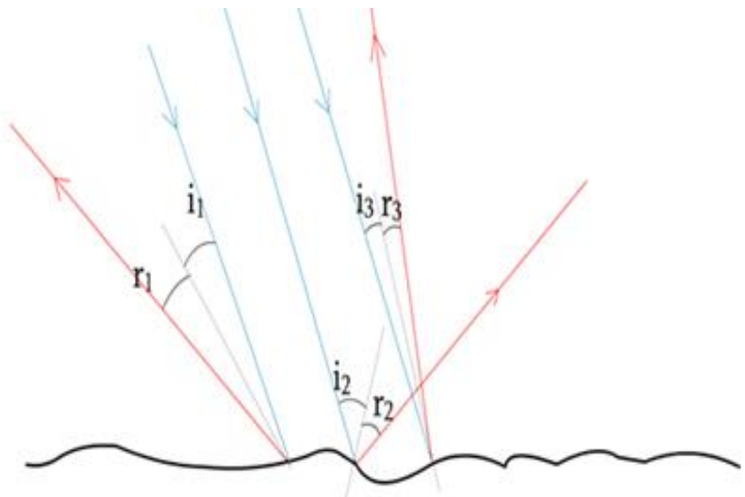
Ans:



The reflection of light from a plane and smooth surface is called regular reflection of light. For regular reflection, the angles of incidence as well as of reflection are the same for all parallel rays falling on the surface. Thus, the reflected rays are also parallel to one another.

3. Irregular reflection of light

Ans:



Reflection of light from a smooth and rough surface

Reflection of light from a rough surface is called irregular reflection of light. In irregular reflection, the angles of incidence for parallel rays of incidence are not equal and therefore their angles of reflection are also not equal.

4. Kaleidoscope

Ans: Take three rectangular mirrors of the same size. Using sticking tape, stick the mirrors together making a triangle with the reflecting surface facing inwards. Take a white paper of triangular shape and fix it with tape at one end of the mirrors closing that end. Insert 4-5 coloured glass pieces in the hollow of the mirrors. Close the other end also with a paper and make a hole in it. Look through the hole towards light. You will see innumerable images of the glass pieces. These are formed due to reflections by the three mirrors. The speciality of a Kaleidoscope is that the designs do not easily repeat themselves. Every time the design is different. The fashion designers use Kaleidoscope for creating new designs.

5. Main source of light – Sun

Ans: The solar energy is generated from the central fusion process that occurs in the surface of the Sun. The temperature in the interior of the Sun is several million degrees and at this temperature the hydrogen atom accelerates and overcomes the mutual repulsive force and helium nuclei is generated from it. The mass of helium is less than hydrogen. This decreased mass is converted into a

huge amount of heat and light energy. 4×10^{26} Joule energy is released from the Sunevery second. Each year, only 1575 to 49837 exajoule energy is received, of which 560 exajoule of energy is used in the world.

Q 2) Write the answers of the following questions.

1. What is refraction of light? Write their examples.

Ans: When the light rays passes from one transparent medium to another transparent medium then the direction of its transmission changes. This is called refraction of light.

Examples. 1. The surface of the stable water appears to be on the surface.

2. The coin at the bottom of the glass appears like coming up on the surface.

3. The part of pencil partially/ half dipped in water appears flat and the part outside the water appears tilted.

4. The sunrise before time and late sunset are also the examples of refraction of light.

2. What is dispersion of light? Tell their examples.

Ans: The process of dissociation of light rays through their constituent colour through a transparent medium is called dispersion.Ex. 1. Due to dispersion, our eyes receive colour sensation. The light rays falls on the object and colour of light gets reflected in our eyes and it seems that there is an object of that colour only.2. The rainbow in sky which we see during rainy season is a combination of refraction of light, dispersion of light and complete internal reflection.

Q 3) Write the scientific reasons.

1. The AMBULANCE is written inverted on the ambulance vehicle.

Ans: In a flat mirror, the left and right sides of objects and images look inverted. 2. When the AMBULANCE is written inverted that time the driver of vehicle in front of ambulance vehicle can read the inverted word and give the way to vehicle. Therefore, the AMBULANCE is written inverted on the ambulance vehicle.

2. There is a mirror behind and in front of you in hair salon.

Ans: After cutting hair, the image of back is produced in rear mirror and it's image appears in the front mirror. Because of this we can understand that the hairs on your neck are cut properly or not. Therefore, there is a mirror behind you and in the front of you in hair salon.

Q 4) Solve the examples.

1. If the angle of incidence is of 35⁰ then find out what is the measure of angle of reflection.

Ans: Angle of incidence ∠ i = 35⁰

According to law of reflection,

∠ i = ∠ r

But ∠ i = 35⁰

∴∠ r = 35⁰

∴Angle of reflection = 35⁰

2. If the reflected ray makes an angle of 70⁰ with the normal, what angle must the incident ray make with the normal?

Ans: Angle of reflection = ∠ r= 70⁰

According to law of reflection,

∠ i = ∠ r

But ∠r = 70⁰

∴∠i = 70⁰

∴Incident ray will make an angle of 70⁰with the normal.

Q 5) Write whether the following statements are true or false.

1. In Kaleidoscope, the designs can easily repeat themselves.

Ans: False (In Kaleidoscope, the designs do not easily repeat themselves..

2. In regular reflection, the angles of incidence as well as of reflection are the same for all parallel rays falling on the surface.

Ans: True

3. The incident ray and the reflected ray are on the opposite sides of the normal.

Ans: True

4. Kaleidoscope is used in submarines.

Ans: False (Periscope is used in submarines.)

Q 6) Identify the correlation.

1. _____: Kaleidoscope: : Submarine: Periscope

Ans: Designers

2. _____: Incident ray: : Rays going away from the mirror: Reflected ray

Ans: Rays coming to the mirror

Q 7) Define the following-

1. Incident ray

Ans: The rays falling on any surface are called incident rays.

2. Reflected rays

Ans: The rays going away from the surface after reflection are called reflected rays.

3. Point of incidence

Ans: The point at which an incident ray falls is called the point of incidence.

4. Reflection of light

Ans: When light rays fall on an object their direction changes and they turn back. This is called the reflection of light.

5. Angle of incidence

Ans: The angle made by incident ray near the normal is called angle of incidence.

6. Normal

Ans: The perpendicular line drawn on the surface near point of incidence is called normal.

7. Angle of reflection

Ans: The angle made by reflected ray near the normal is called angle of reflection.

Question. 8. Write the answers in one sentence.

1. What are the natural sources of light?

Ans: The Sun, stars, firefly, comet are the natural sources of light.

2. What are the artificial sources of light?

Ans: The candle, burning wood, light bulb, tube light, lamp, etc. are the artificial sources of light.

3. How much is the speed of light in air?

Ans: The speed of light in air is $3 \times 10^8 \text{m/s}$.

4. How long does it takes for light rays to reach earth's surface?

Ans: It takes 8 minutes 20 seconds for light rays to reach earth's surface.

5. Which equipments use the properties of reflection of light?

Ans: Kaleidoscope and Periscope use the properties of reflection of light.

6. What is the measure of angle made by normal with point of incidence?

Ans: The measure of angle made by normal with point of incidence is 90^0.

7. What is the speciality of a Kaleidoscope?

Ans: The speciality of a Kaleidoscope is that the designs do not easily repeat themselves.

****