

CLASS 7

Light

Q1. Define light. Write properties of light.

Ans. Light is a form of energy which enables us to see the things.

Properties of light:

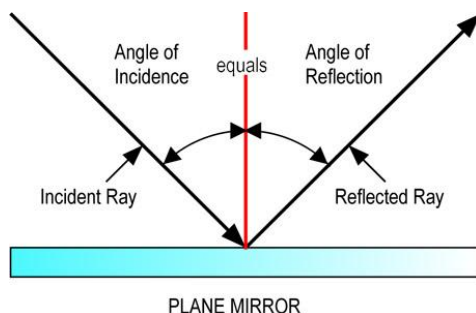
1. Light travels in a straight line. This is called rectilinear propagation of light.
2. Light shows three important phenomena.
 - a. Reflection: Bending of light when it hits a shining surface.
 - b. Refraction: Bending of light when light moves from one medium to another.
 - c. Dispersion: Splitting of white light into seven colors.

Q2. What type of image is formed by a plane mirror?

Ans. Image formed is erect, virtual and is of same size. The distance of image from the mirror is same as the distance of object from the mirror. The image also shows lateral inversion.

Q3. What is reflection of light by a plane mirror?

- Ans. The process of sending back rays of light by changing their direction, when they fall on the surface of an object is known as reflection of light.
- The ray which strikes the surface is called incident ray.
- The ray which bounces back after striking the surface is called reflected ray.
- The point where incident ray strikes the mirror is called point of incidence.
- A perpendicular drawn to the surface of mirror at the point of incidence is called normal (equals).
- The angle between incident ray and normal is called angle of incidence.
- The angle between normal and reflected ray is called angle of reflection.
- Angle of incidence is always equal to angle of reflection.



Q4. Differentiate between:

a) Virtual and Real image

SNo.	Virtual Image	Real Image
1.	Image cannot be obtained on a screen.	It can be obtained on the screen.
2.	It is formed when reflected rays appear to meet behind the mirror.	It is formed when reflected rays actually meet in front of the mirror.
3.	Image formed in a plane mirror is virtual image.	Image formed in pin hole camera is real image.

b) Convex and concave lens

SNo.	Convex lens	Concave lens
1.	It is a converging lens	It is a diverging lens.
2.	It is thicker in the middle and thinner at the edges.	It is thinner at the center than at the edge.
3.	They are curved outwards	They are curved inwards
4.	Real or virtual image is formed, depending upon distance of object from lens.	Always virtual, upright, diminished image is formed.

c) Convex and concave mirror

SNo.	Convex mirror	Concave mirror
1.	Only virtual, diminished image is formed	Both real and virtual image can be formed, depending on distance of object from the mirror.
2.	It is curved outwards	It is curved inwards
3.	It is a diverging mirror	It is a converging mirror.

Q5. What is lateral inversion?

Ans. When the left side of the object appears to be on the right side of the image and when right side of the image appears to be on the left side of the image, it is called lateral inversion.

Q6. Give uses of each of the following:

a) Plane mirror:

- Used in making dressing table as looking glass.
- Used in making periscope and kaleidoscope
- Used as reflectors in solar cookers

b) Concave mirror:

- Used as reflectors in solar cookers to achieve higher temperature as compared to an ordinary solar cooker.
- Used as reflector in solar furnaces for industrial purposes.
- Used in torches and headlights of vehicles.
- Used as a dentist mirror
- Used as a makeup mirror

c) Convex Mirror:

- Used for vigilance at big shops and warehouses
- Used as rear view mirror on the sides of driver's seat
- Used as distance view mirrors at the turning points of narrow staircases.

d) Lenses:

- Used in spectacles: concave lens is used for people who cannot see distant object and convex for those who cannot see near objects.
- Used in camera of all types except in pinhole camera.
- Used in telescope and microscope.

Q7. What do you mean by dispersion of light? How will you prove that light consists of seven colors with the help of Newton's disc: Draw well labeled diagram of Newton's disc.

Ans. The splitting up of white light into seven colors on passing through a transparent medium like a glass prism is called dispersion of light

Newton's disc is a circular cardboard disc which consists of seven rainbow color segments. The colors of a rainbow can be represented by the acronym: VIBGYOR: V – Violet, I - Indigo, B – Blue, G – Green, Y - Yellow, O -Orange and R - Red. When the disc is rotated fast, it appears white. Its principle is that white light consists of seven colors.



Questions

Q1. What is a virtual image? Give one example of a virtual image.

Ans. The image which cannot be obtained on a screen is called a virtual image. A virtual image can be seen only by looking into a mirror. The virtual image is just an illusion and is formed when light rays coming from an object appear to meet after reflection from the mirror. Image formed by a plane mirror and convex mirror is always a virtual image.

Q2. What is a lens?

Ans. A lens is a piece of transparent glass bound by two spherical surfaces.

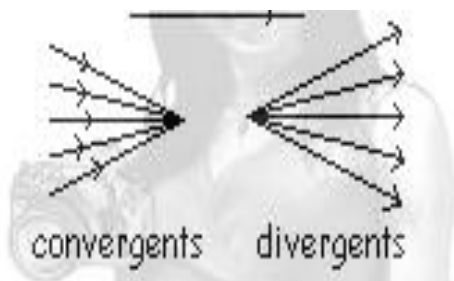
Q3. Whatever be the distance of object from the mirror, nature of image does not change. Identify the mirror

Ans. Convex mirror.

Q 4. Explain divergent and convergent beam of light.

Ans. A beam of light which comes from a broad source of light and converges at a point is called a convergent beam of light.

A beam of light which comes from narrow source of light and diverges out is called a divergent beam of light.



Q5. What is the difference between virtual and image formed by convex and concave lens?

Ans. The virtual image formed by convex lens is enlarged whereas virtual image formed by concave lens is smaller in size than the object or it's a diminished image.