

BIJENDRA PUBLIC SCHOOL, PURNEA

Class : 8

Subject : Science

Chapter - 16 LIGHT

A. Very short answer questions

1. How many images are formed when an object is placed between two plane mirrors held at 90° to each other?

Ans. Three images are formed.

2. Which type / types of mirror always form a virtual image?

Ans. A plane mirror and a convex mirror always forms a virtual image of an object.

3. On which principle, the Kaleidoscope is based?

Ans. Kaleidoscope is based on the principle of multiple reflection.

4. Name the phenomenon of which light is split into seven colours.

Ans. The phenomenon of which light is split into seven colours is called Dispersion of light.

5. Which defect of vision can be corrected by using spectacles made from concave lenses?

Ans. Myopia is the defect of vision can be corrected by using spectacles.

B. Short answer questions.

1. State the laws of reflection.

Ans. There are two laws of reflections:

Law 1 - The angle of incidence (i) is equal to the angle of reflection. (r).

Law 2 - The incident ray, the reflected ray and the normal at the point of incidence all lie in the same plane.

2. How does a real image differ from a virtual image?

Ans. When the light rays after getting reflected from a mirror actually meet at a point real image is formed. It can be obtained on a screen.

When the light rays after getting reflected from a mirror appear to meet at a point, a virtual image is formed. It can be seen only through a mirror.

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

Ans. The characteristics of the image formed by a plane mirror are:-

- i. The image formed by a plane mirror is of the same size as the object.
- ii. Image formed by a plane mirror is erect.
- iii. Image formed at the same distance behind the mirror as the object is in front of it.
- iv. Plane mirror always forms a virtual image.

4. Name the main parts of the human eye.

Ans. The main parts of the human eye are-

- | | | |
|------------|--------------------|---------------|
| i. Cornea | ii. Iris and pupil | iii. Eye lens |
| iv. Retina | v. Blind spot | |

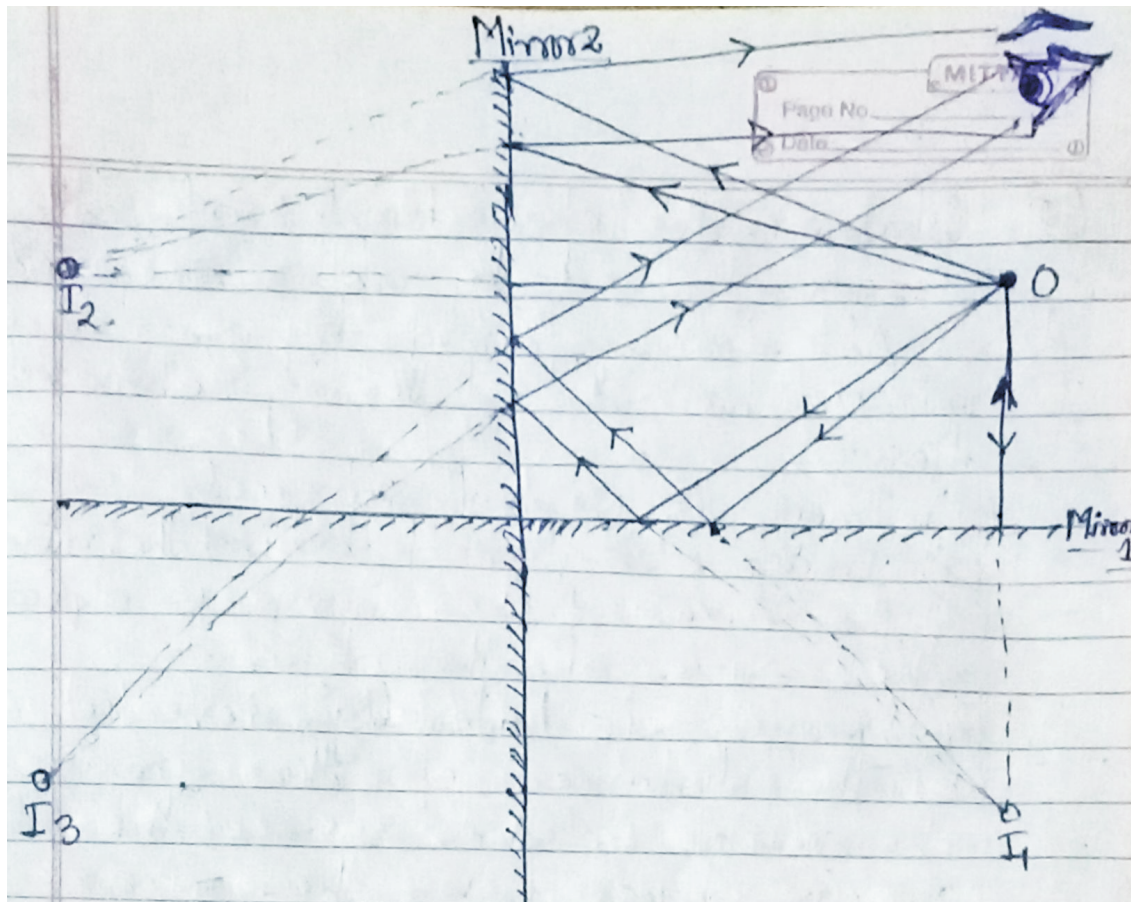
5. What is night blindness? How can it be cured?

Ans. Night blindness is a kind of eye disease which occurs due to deficiency of vitamin A. We can cure it by maintaining a healthy diet - eating foods rich in vitamin A.

C. Long answer type questions.

1. Show the formation of images when an object is placed in between the two mirrors held at right angle.

Ans. When an object is placed in front of two plane mirrors placed at right angles to each other, three images are formed which can be shown as:



2. How does the diffused reflection differ from the regular reflection?

Ans. Diffused reflection occurs when light reflects off a rough surface, the light reflects in different directions. Hence reflection is not clear and image is also not clear. Regular reflection occurs when light reflects off a smooth surface, they are reflected parallelly. Hence reflection is clear and image formed is also clear.

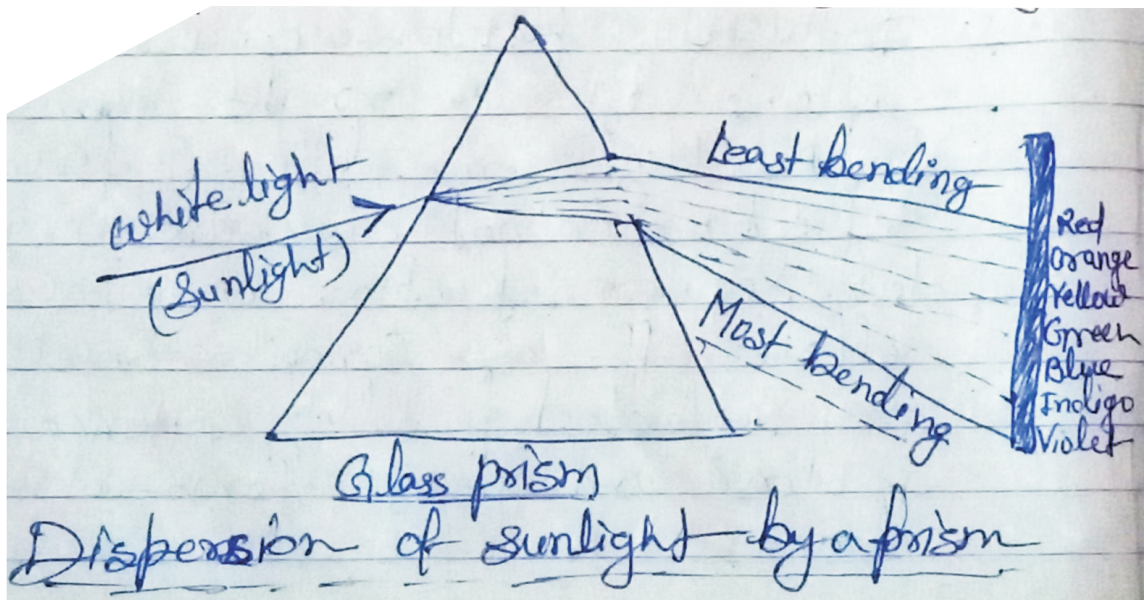
3. What are the characteristics of the image formed by a plane mirror?

Ans. An image formed by a plane mirror has the following characteristics.

- i. Image is virtual and erect.
- ii. Image is formed behind the mirror.
- iii. The size of the image is equal to the size of the object.
- iv. Image is laterally inverted.
- v. The distance of the image behind the mirror is the same as the distance of an object from the mirror.

4. With the help of a diagram show the dispersion of white light by a prism.

Ans.



5. Distinguish between myopia and hypermetropia. How can these defects be corrected?

Ans. Myopia and hypermetropia both are common eye-defects. Myopia is also known as short sightedness in which a person can see clearly the near objects, where as the faraway objects appear blurred. But, Hypermetropia also known as long sightedness, in which a person can see clearly the far away objects but the near objects appear blur. Myopia can be corrected by using concave lenses and hypermetropia can be corrected by using convex lens.

D. Tick (✓) The ODD-ONE out giving reason.

1. Plane mirror, Virtual image, Erect image, Real image.

Ans. Real image is odd one because rest three are connected to each other. (i. e. Plane mirror always forms virtual and erect image.)

2. Regular reflection, Sharp image, Angle of incidence = Angle of reflection, Irregular reflection.

Ans. Sharp image is the odd one because it is a type of image but Angle of incidence = Angle of reflection is connected with both type of reflection as a same way.

3. Kaleidoscope, Multiple reflection, Single reflection, Changing patterns.

Ans. Single reflection is odd one because it is the reflection of single light ray but the rest three are directly connected to each other.

4. Periscope, Principle of reflection, Object not in the line of sight, Multiple images.

Ans. Multiple images is the odd one because Periscope is based on principle of reflection and can work when object is not in the line of sight.

5. Glass prism, Dispersion of light, Reflection of light, Seven colour band.

Ans. Reflection of light is the odd one because glass prism shows the phenomena of dispersion of light in which white sunlight shows seven colour band.

E. Define the following terms.

1. Laws of reflection
2. Regular and irregular reflections
3. The periscope
4. Dispersion of white light
5. Defects of vision

Ans. 1. Laws of reflection : There are two laws of reflection:

Law 1 : The angle of incidence (L_i) is equal to the angle of reflection (L_r).

Law 2 : The incident ray, the reflected ray and the normal at the point of incidence all lie in the same plane.

2. Regular and irregular reflections:

Regular reflections: When a ray of light reflected by a smooth surface, it gets reflected along a particular direction and called regular reflection.

Irregular reflection: When a ray of light reflected by a rough surface, it gets reflected in different directions. This type of reflection is called irregular reflection.

3. The periscope : Periscope is a device which is based on the principle of reflection by plane mirrors. It is used for seeing objects which are not in direct line of sight. It is used in the submarine.

4. Dispersion of white light : When beam of white sunlight is passes through a prism then it splits into its seven colours which we are able to see on the paper screen. This phenomena is called Dispersion of white light.

5. Defects of vision : The abnormalities in the normal vision of the eye are called defects of vision or defects of eyes.

- a. Myopia (or short sightedness)
- b. Hypermetropia (or long sightedness)

HOTS - Higher Order Thinking Skills.

1. A ray of light falling on a rough surface follows the laws of reflection but no image of the object placed before it is seen. Explain why it is so?

Ans. The light rays falling on a rough surface follows the laws of reflection but no image is seen because the light rays are incident parallel on the rough surface but due to rough surface, the light rays are not reflected parallel rather they are reflected in different direction.

2. Why does a ray of light passing through a glass slab not show dispersion?

Ans. A ray of light passing through a glass slab acts as a double prism and the scattered light by one prism is cancelled by the another because of which the Dispersion of light cannot be observed.

3. A ray of light from a point object diverges after reflection or refraction. Is the image formed is real or virtual?

Ans. When a light ray diverges after reflection or refraction, the various rays emanating from the same point do not converge in real space. They all go farther away from each other. Hence the rays are not able to meet after reflection or refraction, so that virtual image is formed.

4. Will a spectrum be formed if a ray of monochromatic light falls on a prism? Explain.

Ans. If a ray of monochromatic light falls on a prism then spectrum is not able to form because spectrum is formed due to breaking up of light into many other light rays due to variation in wavelength. But a monochromatic light ray won't break so there will be no spectrum.