

Very Short Answer Questions

Q.1. The image formed by a lens is always virtual, erect and smaller in size for an object kept at different positions in front of it. Identify the nature of the lens.

[NCERT Exemplar]

Ans. Concave lens

Q.2. The side mirror of a scooter got broken. The mechanic replaced it with a plane mirror. Mention any inconvenience that the driver of the scooter will face while using it.

[NCERT Exemplar]

Ans. The driver will not be able to see traffic spread over a large area behind him.

Q.3. The concave reflecting surface of a torch got rusted. What effect would this have on the beam of light from the torch?

[NCERT Exemplar]

Ans. The beam of light will be diffused with lower intensity.

Q.4. The distance between an object and a convex lens is changing. It is noticed that the size of the image formed on a screen is decreasing. Is the object moving in a direction towards the lens or away from it?

[NCERT Exemplar]

Ans. The object is moving away from the lens.

Q.5. What is a ray?

Ans. The direction of the path in which light is travelling is called a ray.

Q.6. What type of image is formed on a cinema screen?

Ans. Real image

Short Answer Questions

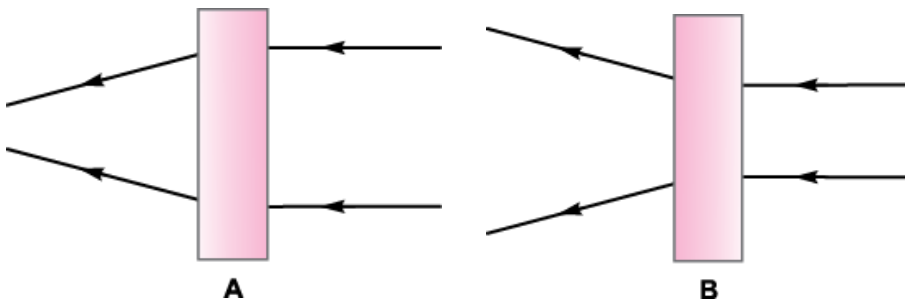
Q.1. What type of mirror is used as a side mirror in a scooter? Why is this type of mirror chosen?

[NCERT Exemplar]

Ans. Convex mirror. Convex mirrors can form images of objects spread over a large area. So, these help the drivers to see the traffic of a large area behind them.

Q.2. Observe the figures given below carefully.

Ans.



The given figures show the path of light through lenses of two different types, represented by rectangular boxes A and B. What is the nature of lenses A and B?

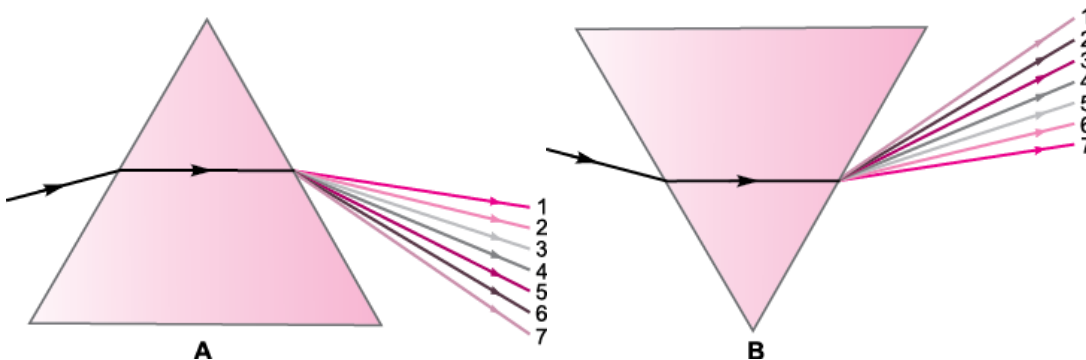
Ans. A – convex lens; B – concave lens.

Q.3. Boojho made light from a laser torch to fall on a prism. Will he be able to observe a band of seven colours? Explain with a reason.

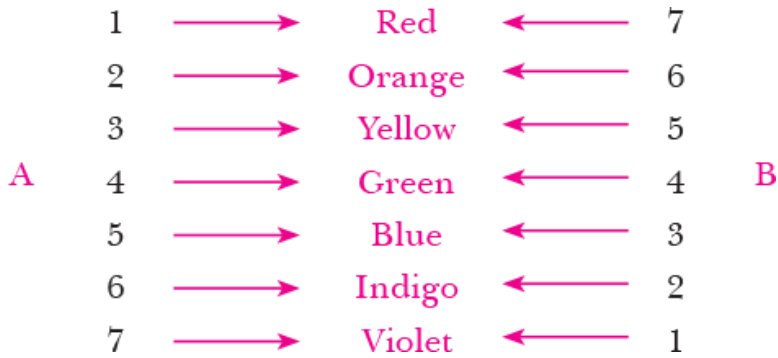
[NCERT Exemplar]

Ans. No, laser torch gives out light of only one colour.

Q.4. State the correct sequence (1-7) of colours in the spectrum formed by the prisms A and B, shown in figure.



Ans.



Q.5. An erect and enlarged image of an object is formed on a screen. Explain how this could be possible.

[NCERT Exemplar]

Ans. The image formed on the screen could be enlarged and erect if the object is placed upside down between F and 2F of the lens.

Q.6. Two different type of lenses are placed on a sheet of newspaper. How will you identify them without touching?

[NCERT Exemplar]

Ans. If the letters appear bigger/magnified, then the lens is a convex lens. If the letters appear smaller, then the lens will be concave lens.

Q.7. A shopkeeper wanted to fix a mirror which will give a maximum view of his shop. What type of mirror should he use? Give reason.

[NCERT Exemplar]

Ans. He will fix a convex mirror because it can form images of objects spread over a large area.

Q.8. It was observed that when the distance between an object and a lens decreases, the size of the image increases. What is the nature of this lens? If you keep on decreasing the distance between the object and the lens, will you still able to obtain the image on the screen? Explain.

[NCERT Exemplar]

Ans. It is a convex lens.

No, when the object is placed close to a convex lens then the image formed is virtual which cannot be obtained on screen.

Q.9. Suppose we wish to obtain the real image of a distant tree. Explain two possible ways in which we can do it.

[NCERT Exemplar]

Ans. (a) By using a concave mirror and a screen.

(b) By using a convex lens and a screen.

Q.10. What is regular and irregular reflection?

Ans. Regular reflection: It is the reflection from a smooth surface such that the light rays are evenly parallel to each other and an image is formed. For example, reflection from the smooth surface of calm lake can produce an image in water.

Irregular reflection: It is the diffused reflection from uneven surface such that the light rays are not parallel to each other and do not form an image. For example, reflection of light from the surface of a flowing stream does not form an image.

Long Answer Questions

Q.1. What is rectilinear propagation of light? How will you prove it?

Ans. Light travels in a straight line. This is called rectilinear propagation of light.

Activity:

- Take a straight straw and look at the light rays through it.
- Take another straw which is bent and try to look at the light rays through it. You will observe that when the straw was straight you could see the light and when the straw was bent you could not see the light.
- This means that we cannot bend the ray of light to travel through the bent straw.
- Thus, this activity proves that light travels in a straight line.

Q.2. You are given three mirrors of different types. How will you identify each one of them?

[NCERT Exemplar]

Ans. The three different types of mirrors can be identified by forming the images.

- Plane mirror forms an erect image which is of the same size as the object. The image formed by plane mirror cannot be obtained on a screen, i.e, it is virtual.
- Concave mirror forms both real and virtual images. The image can be smaller or larger in size than the object.
- Convex mirror always produces virtual and upright images. The size of the image is always smaller than the object.

Q.3. Distinguish between the following.

Q. Real image and Virtual image

Ans.

S. No.	Real image	Virtual image
(i)	The reflected rays actually meet after reflection.	The reflected rays do not meet but appear to come from a point.
(ii)	It can be obtained on a screen.	It cannot be obtained on a screen. It is formed behind the mirror.
(iii)	It is formed in front of the mirror.	

Q. Convergent beam and Divergent beam

Ans.

S. No.	Convergent beam	Divergent beam
(i)	It is a beam of light which comes together as if to meet or join.	It is a beam which proceeds in different directions from a point.
(ii)	Beams converge in convex lenses and concave mirrors.	Beams diverge in concave lenses and convex mirrors.

Q.4. Explain the reflection of light on white paper screen with the help of an activity.

Ans. Activity:

- Place a concave mirror fixed on a stand, on a table. Make a screen of about 15 cm × 10 cm using white paper pasted on a cardboard.
- Keep a lighted candle at a distance of 50 cm from the mirror, on a table.
- Try to obtain the image of the flame on the screen, by moving the screen till a sharp image of the flame is obtained.
- Next, move the candle towards the mirror and place it at different distances from it, so as to obtain the image on the screen.
- You will observe that the image formed by a concave mirror can be smaller or larger in size than the object or may be real or virtual.

Q.5. With the help of Newton's disc, prove that seven colours of the rainbow can be recombined and produce white light.

Ans. Activity:

- Take a circular cardboard. Split the disc into seven equal sections.
- Colour the first section with violet, the second with indigo, the third with blue, and so on in the order of VIBGYOR in an anticlockwise direction.
- Drill a suitable hole in the centre of the disc.
- Take a piece of round wood as a spindle. Cut the length as required. Glue the spindle into the hole.
- Now, spin the coloured disc very quickly. Your eyes would see all the colours at once and disc would appear to be white.

HOTS (Higher Order Thinking Skills)

Q.1. Why is it advised not to look directly towards the Sun?

Ans. It is advised that never look directly towards the Sun or its image as it may damage our eyes.

Q.2. Why do lemons kept in a glass of water appear to be enlarged?

Ans. Water acts as a convex lens, which is a magnifying lens, due to its density. Therefore, lemons kept in water appear larger.