Board – CBSE	Class – 7	Topic – Light

1. State the characteristics of the image formed by a plane mirror.

   Ans.

   (i) The plane mirror forms an erect image.

   (ii) It forms a virtual image.

   (iii) The size of the image is the same as that of the object.

   (iv) Image is formed at the same distance behind the mirror as the object stands in front of it.

   (v) The image formed is laterally inverted, i.e., the right-hand side of the object seems to be the left-hand side and vice-versa.

2. What is a virtual image? Give one situation where a virtual image is formed.

   Ans.

   The image which cannot be taken on a screen is called a virtual image. For example, when some object is placed very close to the concave mirror, we don't get any image on the white screen placed behind the mirror. Such an image is called a virtual image.

3. State two differences between a convex and a concave lens.

Convex lens	*Concave lens*
(*i*) Convex lens can form both real and virtual images.	(*i*) Concave lens always forms a virtual image.
(*ii*) It can form magnified image.	(*ii*) Image is always diminished in size.

4. Give one use each of a concave and a convex mirror.

   Ans.

   Use of concave mirror:

   Dentists use a concave mirror to examine the teeth.

Use of convex mirror:

A convex mirror is used as a side-view mirror in vehicles

5. Which type of lens forms always a virtual image?

   Ans.

   A concave lens always forms a virtual image.

6. What is a diverging lens?

   Ans.

   A concave lens diverges (bends outward) the light and is called a diverging lens.

7. Why are we not able to see the candle flame through a bent pipe?

   Ans.

   We cannot see the candle flame through a bent pipe because light travels along straight lines.

8. What happens when light falls on a mirror?

   Ans.

   A mirror changes the direction of light that falls on it. This change of direction by a mirror is called the reflection of light.

9. Differentiate between a real image and a virtual image.

   Ans:

Real Image	Virtual Image
1. It can be obtained on a screen 2. Inverted 3. Light rays converge at a real point on the screen	1. It cannot be obtained on a screen 2. Erect 3. Light rays appear to converge at a point

4. Formed by a concave mirror, convex lens	4. It is formed by a plane mirror, concave lens, etc.

10. Explain how a concave mirror can be used to burn a piece of paper.

    Ans:

    A concave mirror can be used to focus the image of the sun on paper. A concave mirror is taken and held facing the sun. A paper is held near, and light rays from the sun can be focused on the paper by adjusting the distance of the paper until a sharp, bright spot is

    obtained on the paper. That bright spot is the real image of the sun on the paper. The paper and mirror are held in that position steadily for some time. It can be seen that the paper starts to burn at the spot of the real image. This is because the light rays from the sun were concentrated on a single point for long enough to cause the paper to heat up and burn.

11. List few uses of spherical mirrors.

    Ans:

    Spherical mirrors have many applications.

    - Concave mirrors are used to enlarge objects.
    - Doctors use this type of mirror to enlarge ears, eyes, nose and throat.
    - Dentists also use them to enlarge the image of teeth.
    - The headlights of the vehicles are concave on the surface.
    - Convex mirrors are used to observe a large field as they form images of objects spread over a large area.
    - Thus, they are used as side mirrors in cars and mirrors placed at blind turnings on roads.
    -

12. When is a rainbow observed in the sky?

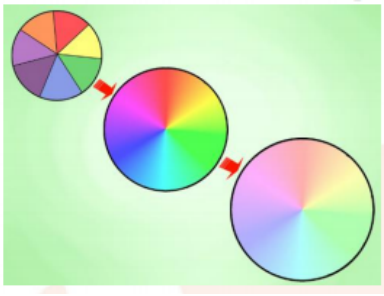
    Ans:

A rainbow is seen in the sky, usually after the rain when the sun is low in the sky. The water

droplets in the air act as a prism and disperse the light to form a rainbow.

13. Explain Newton disc.

    Ans:



    Newton disc was invented by Isaac Newton. It is a spherical

    disc containing seven segments. Each segment corresponds to

    one colour in the rainbow. Thus the seven colours in the Newton disc segments are violet, indigo, blue, green,

    Yellow, orange and red. When the disc is rotated, the colours start to fade to form a single white colour. Newton thus demonstrated that white light is a combination of 7 different colours found in the rainbow.

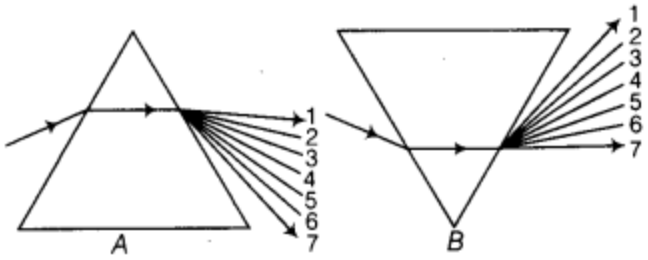
14. What type of mirror is used as a side mirror in a scooter? Why is this type of mirror chosen?

    Ans

    A convex mirror is a side mirror in a scooter because it can form diminished images of objects spread over a larger area.

    So, this helps the driver to have a wide field of view of traffic.

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



Answer:

When white light is passed through a prism, it disperses into its seven constituent colours.

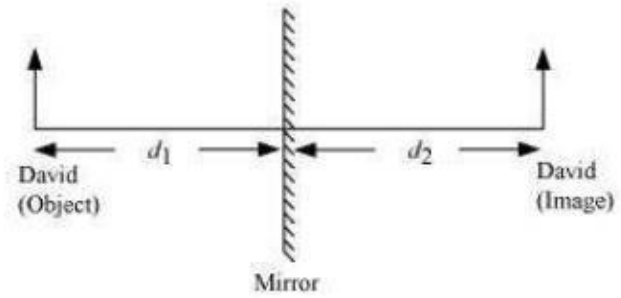
For *A*	For *B*
1. ⟶ Red	1. ⟶ Violet
2. ⟶ Orange	2. ⟶ Indigo
3. ⟶ Yellow	3. ⟶ Blue
4. ⟶ Green	4. ⟶ Green
5. ⟶ Blue	5. ⟶ Yellow
6. ⟶ Indigo	6. ⟶ Orange
7. ⟶ Violet	7. ⟶ Red

16. David is observing his image in a plane mirror. The distance between the mirror and his image is 4 m. If he moves 1 m towards the mirror, what is the distance between David and his image?

Ans

6 m

In the case of a plane mirror, the distance between the object and the mirror (d_1) is the same as the distance between the image and the mirror (d_2).



Given,

Distance between the mirror and David's image, $d_2 = 4$ m

Therefore, $d_1 = d_2 = 4$ m

If David moves 1 m towards the mirror, then $d_1 = 4 - 1 = 3$ m

Again, $d_1 = d_2 = 3$ m

Therefore, the distance between David and his image is $d_1 + d_2 = 3 + 3 = 6$ m.