

## Worksheet -Class X, Chapter-10, Light

### (1/2: Reflection of Light)

- In torches, search lights and headlights of vehicles, the bulb is placed
  - between the pole and the focus of the reflector
  - very near to the focus of the reflector
  - between the focus and centre of curvature of the reflector
  - at the centre of curvature of the reflector.
- A student wants to project the image of a candle flame on the walls of the school laboratory by using a mirror.
  - Which type of mirror should he use and why?
  - At what distance, in terms of focal length 'f' of the mirror, should he place the candle flame to get the magnified image on the wall?
  - Draw a ray diagram to show the formation of the image in this case.
  - Can he use this mirror to project a diminished image of the candle flame on the same wall? State 'how' if your answer is 'yes' and 'why not' if your answer is 'no'.
- In this question, two statements are given- one labelled **Assertion (A)** and the other labelled **Reason (R)**. Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below:*
  - Both A and R are true, and R is correct explanation of the assertion.*
  - Both A and R are true, but R is not the correct explanation of the assertion.*
  - A is true, but R is false.*
  - A is false, but R is true.*

**Assertion (A):**Plane mirror may form real image

**Reason (R):** Plane mirror forms virtual image if object is real.

- Explain why a ray of light passing through the centre of curvature of a concave mirror, gets reflected along the same path?
- A 6 cm tall object is placed perpendicular to the principal axis of a concave mirror of focal length 30 cm. The distance of the object from the mirror is 45 cm. Use mirror formula to determine the position, nature and size of the image formed. Also draw labelled ray diagram to show the image formation in this case.
- If the image formed by mirror for all positions of the object placed in front of it is always virtual and diminished, state the type of the mirror. Draw a ray diagram in support of your answer. Where are such mirrors commonly used and why?
- A 5 cm tall object is placed at a distance of 30 cm from a convex mirror of focal length 15 cm. Find the position, size and nature of the image formed.
- To construct a ray diagram, we use two rays which are so chosen that it is easy to know their directions after reflection from the mirror. List two such rays and state the path of these rays after reflection in case of concave mirror. Use these two rays and draw ray diagram to locate the images of an object placed between the pole and focus of a concave mirror.
- A concave mirror produces three times magnified image on a screen. If the object is placed 20 cm in front of the mirror, how far is the screen from the object?
- Suppose you have three concave mirrors, A, B and C of focal lengths 10 cm, 15 cm and 20 cm. For each concave mirror you perform the experiment of image formation for three values of object distances of 10 cm, 20 cm and 30 cm. By giving reason, answer the following.
  - For the three object distances identify the mirror/mirrors which will form an image of magnification -1.
  - Out of the three mirrors identify the mirror which would be preferred to be used for shaving purpose/makeup.
  - For the mirror B draw ray diagram for image formation for object distances 10 cm and 20 cm.