# WORKSHEET 1

## CHAPTER 10 – SPHERICAL MIRRORS

### A. Tick (✓) the correct option.

1. A full length image of a distant tall tree can definitely be seen by using
   a. a concave mirror.
   b. a convex mirror.
   c. a plane mirror.
   d. none of these.
2. The focal length of a concave mirror is 20 cm. At what distance from the mirror an object is placed so as to form a real and inverted image of the same size?
   a. 20 cm
   b. 10 cm
   c. 30 cm
   d. 40 cm
3. For an object kept at a distance 36 cm from a concave mirror of focal length 12 cm. The image is
   a. real, inverted and diminished.
   b. real, erect and diminished.
   c. virtual, inverted and magnified.
   d. virtual, erect and magnified.
4. A concave mirror has a
   a. virtual focus.
   b. real focus.
   c. diminished focus.
   d. two focuses.
5. A ray of light is directed towards the centre of curvature of a spherical mirror. The reflected ray will
   a. pass through the pole.
   b. pass through the focus.
   c. pass through the centre of curvature.
   d. become parallel to the principal axis.

### B. Fill in the blanks.

1. _____ has wider field of view.
2. If the focal length of a mirror is 10 cm, its radius of curvature will be _____
3. A ray of light passing through the _____ retraces its path.
4. When the object is placed at the focus of a concave mirror, the image will be formed at _____
5. The image formed by a convex mirror is always _____, _____ and _____

### C. State whether the following statements are true or false.

1. The angle of incidence is equal to the angle of reflection.
2. The image formed by a convex mirror is always virtual.
3. The image formed by a concave mirror is always real.
4. Convex mirror is used in floodlight.
5. The image is formed at the focus when the object is at infinity from a concave mirror.

Name: ..... Teacher's signature: .....

Class: IX Date: .....

## D. Match the following.

| | | |
|---|---|---|
| 1. | Mirror formula | concave mirror |
| 2. | Positive focus | $\frac{v}{u}$ |
| 3. | Negative focus | $\frac{R}{2}$ |
| 4. | Focal length | convex mirror |
| 5. | Magnification | $\frac{1}{f} = \frac{1}{v} + \frac{1}{u}$ |

## E. Answer the following questions.

### Very short answer questions

1. When a concave mirror is used as a shaving mirror, where is the person's face in relation to the focus of the mirror? State the characteristics of the image seen.
2. Name the mirror which always produces erect and virtual image. How is the size of image related to the size of object?

### Short answer questions

1. Name the kind of mirror used to obtain:
   i. A real and enlarged image.
   ii. A virtual and enlarged image.
   iii. A virtual and diminished image.
   iv. A real and diminished image.
2. State the kind of mirror used:
   i. By a dentist.
   ii. As a search light reflector.
   iii. Seeing a rear view in vehicles.

### Long answer questions

1. You are provided with a plane, a convex and a concave mirror. How will you distinguish them without touching or using any other apparatus?
2. What are differences between concave mirror and convex mirror?

# ANSWERS

## WORKSHEET 1

### A. Tick (✓) the correct option.

1. b 2. d 3. a 4. a 5. c

### B. Fill in the blanks.

1. Convex mirror
2. 20 cm
3. centre of curvature
4. infinity
5. virtual, erect and diminished

### C. State whether the following statements are true or false.

1. T 2. T 3. F 4. T 5. T

### D. Match the following.

| | |
|---|---|
| 1. Mirror formula | $\frac{1}{f} = \frac{1}{v} + \frac{1}{u}$ |
| 2. Positive focus | convex mirror |
| 3. Negative focus | concave mirror |
| 4. Focal length | $\frac{R}{2}$ |
| 5. Magnification | $\frac{v}{u}$ |

### E. Answer the following questions.

**Very short answer questions**

1. When a concave mirror is used as a shaving mirror, the person's face is between the pole and the focus.
   i. The image thus formed will be virtual, magnified and upright.
   ii. The incident ray, the normal and the reflected ray all lie in the same plane.
2. Convex mirror always produces erect and virtual image. Size of the object increases with the decrease in the distance of the object from the mirror.

**Short answer questions**

1. i. Concave mirror.
   ii. Concave mirror.
   iii. Convex mirror.
   iv. Concave mirror.
2. i. Concave mirror.
   ii. Concave mirror.
   iii. Convex mirror.

**Long answer questions**

1. We put a pen in front of the mirrors:
   i. If the image formed is erect, virtual, upright and is of same size as object, then it is a plane mirror.
   ii. If the image formed is erect, virtual, upright and magnified, then it is a convex mirror.
   iii. If the image formed is erect, real, inverted and diminished, then it is a concave mirror.
2. Differences between concave mirror and convex mirror

| Parameter | Concave Mirror | Convex Mirror |
|---|---|---|
| 1. Reflection of light | Reflection takes place at the concave surface (or bent-in surface). | Reflection takes place at the convex surface (or bulging out surface). |
| 2. Nature | A parallel beam of light falling on this mirror converges at a point after reflection. | A parallel beam of light falling on this mirror appears to diverge from a point after reflection. |
| 3. Action | It is a converging mirror. | It is a diverging mirror. |
| 4. Focus | It has a real focus. | It has a virtual focus. |