

## Practice set 1

### SECTION A

1 × 10 = 10]

1. Three students A, B and C focused on a distant building on a screen with the help of a concave mirror. To determine focal length of the concave mirror they measured the distances as given below:

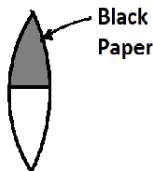
Student A : From mirror to the screen

Student B : From building to the screen

Student C : From building to the mirror

Who measured the focal length correctly?

- (a) Only A  
(b) Only B  
(c) A and B  
(d) B and C
2. In case of concave mirror, the minimum distance between the real object and its real image is  
(a) F  
(b) 2f  
(c) 4f  
(d) Zero
3. If the refractive index of water with respect to air is  $\frac{4}{3}$ , then the refractive index of air with respect to water is  
(a)  $\frac{3}{4}$   
(b)  $\frac{4}{3}$   
(c)  $\frac{16}{9}$   
(d)  $\frac{9}{16}$
4. How will the image formed by the a convex lens be affected if the upper half of the lens is wrapped with a black paper ?



- (a) The size of the image is reduced to one-half  
(b) The upper half of the image will be absent  
(c) The brightness of the image is reduced  
(d) There will be no effect
5. A mirror can produce a magnified virtual image. The nature of the mirror is

- (a) Convex
- (b) Concave
- (c) Plane
- (d) None of these

6. In a museum a child walks towards large concave mirror . He will see that

- (a) His real , erect image goes on decreasing in size
- (b) His virtual , erect image goes on increasing in size
- (c) His real , inverted image goes on increasing in size and suddenly it becomes virtual , erect and magnified .
- (d) His real, erect image goes on diminishing in size and suddenly it becomes virtual , erect and magnified .

7. Rays from Sun converges at a point 15 cm in front of a concave mirror. Where should an object be placed so that size of its image is equal to the size of the object ?

- (a) 15cm in front of the mirror
- (b) 30cm in front of the mirror
- (c) Between 15cm and 30cm in front of the mirror
- (d) More than 30cm in front of the mirror

8. When light travels from a rarer to a denser medium it will have

- (a) Increased velocity
- (b) Decreased velocity
- (c) Decreased wavelength
- (d) Both (b) and (c)

**These questions given below consist of an assertion and the reason. Use the following key to choose the appropriate answer.**

- (a) Both the Assertion and the Reason are correct, and the Reason is the correct explanation of the Assertion**
- (b) Both the Assertion and the Reason are correct, but the Reason is not the correct explanation of the Assertion**
- (c) Assertion is true but Reason is false**
- (d) Both Assertion and Reason are false**

9. Assertion: Convex mirror used in streetlight.

Reason: Convex mirror diverges light over a smaller area than the plane mirror.

10. Assertion : Red light travels faster in glass than the green light  
Reason : Red light has a wavelength larger than green.

**SECTION B**

**[ 2 × 2 = 4 ]**

11. The refractive index of diamond with respect to glass is 1.6 and the absolute refractive index of glass is 1.5. Find out the absolute refractive index of diamond.
12. A diverging mirror of focal length 20cm forms an image of 12cm from the mirror. Find where the object is placed.

**SECTION C**

**[ 3 × 2 = 6 ]**

13. (a) “ A convex lens of focal length ‘f’ can form a magnified erect as well as inverted image .” Justify this statement stating the position of the object with respect to the thin lens in each case for obtaining these images.
- (b) A convex lens of focal length 25cm and a concave lens of focal length 10cm are placed in close contact with each other. Calculate the lens power of this combination.

14. The linear magnification produced by a spherical mirror is  $- 1/5$ . Analysing this value state the (i) type of spherical mirror and the position of the object with respect to pole of the mirror. Draw ray diagram to justify your answer.

Ans. (i) Concave mirror

(ii) Object is placed beyond C

**SECTION D**

**[ 5 × 1 = 5 ]**

15. (a) Which mirror can be conveniently used as a make-up mirror? Draw a ray diagram to illustrate this function?

(b) If the image formed by a lens for all positions of an object placed in front of it is always erect and diminished, what is the nature of this lens. Draw a ray diagram to justify your answer.