

Class10 CBSE Test paper Chapter: Reflection and Refraction of Light - 01

1. Q. A student has three concave mirrors A, B, C of focal lengths 20 cm, 15 cm and 10 cm respectively. For each concave mirror he performs the experiment of image formation for three values of object distance of 30 cm, 10 cm and 20 cm.

Giving reason answer the following:

- For the three object distances identify the mirror which will form an image equal in size to that of object. Find at least one value of object distance.
- Out of the three mirror identify the mirror which would be preferred to be used for shaving purpose.
- For the mirror B draw ray diagram for image formation for any two given values of object distance.

Ans: (a) Mirror B of focal length 15cm this is because an image equal in size to that of object is formed if object placed at C

(b) For shaving purpose object is placed between f and O so that magnified virtual image can be produce . Thus the mirror which would be preferred to be used for shaving purpose is B

(c) Do your self

2. Q given da. For the ta showing focal length of three concave mirrors A B and C, and respective distance of different objects from these mirrors.

Mirror A has $u = 45$ $f = 20$ and Mirror B has $u = 30$ $f = 15$ and Mirror C, $u = 20$ $f = 30$

Answer: In the given position of object from the mirrors, which mirror will form the diminished image of the object

Ans: the diminished image of the object is formed if object placed beyond "C"

So the correct mirror is A

3. Q. A small candle 2.5cm in size is placed at 27 cm in front of concave mirror of radius of curvature 36 cm. If the candle is moved close to the mirror. How will the screen has to be moved?

Answer: $h_o = 2.5$ cm, $u = 27$ cm, $f = 18$ cm

So, If the candle is moved closer to the mirror, then the screen will have to be moved away from the mirror in order to obtain real and inverted image the image

Ans: The shifting in the emergent ray with respect to the incident ray on passing light ray from glass slab is called lateral shift or lateral displacement.

Lateral displacement depends mainly on:

(i) Angle of incidence (ii) thickness of glass slab (iii) Refractive index of glass slab.

10. Q. When sunlight is concentrated at a paper at the principal focus of a convex lens, what happens to the paper?

Ans: Paper starts burning because Sun light ray, after refracting through the lens, converges at a very sharp point.

11.Q. What are the differences between the virtual image formed by plane, concave and convex mirror.

Answer: Virtual image formed by plane mirror is equal in size of object

Virtual image formed by concave mirror is greater than the size of object

Virtual image formed by convex mirror is smaller than the size of object

12.Q. Speed of light in transparent medium is 0.7 times that of its speed in vacuum. Calculate the absolute refractive index of the medium.

Ans: Given, $V = 0.7C$

The absolute refractive index of the medium = $C/V \Rightarrow C/0.7C = 1.428 = 1.43$

13. Q. Which kind of mirrors are used in the headlights of a motor-car and why?

Answer: Concave mirrors are used to get powerful parallel beam of light in the forward direction.

14.Q. "A concave mirror of focal length 'f' can form a magnified, erect as well as an inverted image of an object placed in front of it." Justify this statement stating the position of the object with respect to the mirror in each case for obtaining these images.

Ans: When object is placed between P and F, an erect, magnified, virtual image is formed. When the object is placed between F and C as well as F, an inverted, real magnified image is formed.

15.Q. Define and show on a diagram, the following terms relating to a concave mirror: (i) Aperture (ii) Radius of curvature

Answer: (i) The diameter of the concave mirror is called its aperture. (ii) The radius of the sphere of which the concave mirror is a part of is called its radius of curvature. $R = CP$

