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Light Reflection And Refraction T2

10th Standard

Science

16 x 1 = 16

1) Which one of the following materials cannot be used to make a lens?

(a) Water (b) Glass (c) Plastic (d) Clay

2) The image formed by a concave mirror is observed to be virtual, erect and larger than the object.Where should be the position of the object?

(a) Between the principal focus and the centre of curvature (b) At the centre of curvature

(c) Beyond the centre of curvature (d) Between the pole of the mirror and its principal focus.

3) Where should an object be placed in front of a convex lens to get a real image of the size of the object?

(a) At the principal focus of the lens (b) At twice the focal length (c) At infinity

(d) Between the optical cantre of the lens and its principal focus

4) A spherical mirror and a thin spherical lens have each a focal length of - 15 cm. The mirror and the lens are likely to be

(a) both concave (b) both convex (c) the mirror is concave and the lens is convex.

(d) the mirror is convex, but the lens is concave.

5) No matter how far you stand from a mirror, your image appears erect. The mirror is likely to be

(a) plane (b) concave (c) convex (d) either plane or convex

6) Which of the following lenses would you prefer to use while reading small letters found in a dictionary?

(a) A convex lens of focal length 50 cm (b) A concave lens of focal length 50 cm

(c) A convex lens of focal length 5 cm (d) A concave lens of focal length 5 cm

7) In torches search lights and headlights of vehicles the bulb is placed

(a) between the pole and the focus of the reflector (b) very near to the focus of the reflector

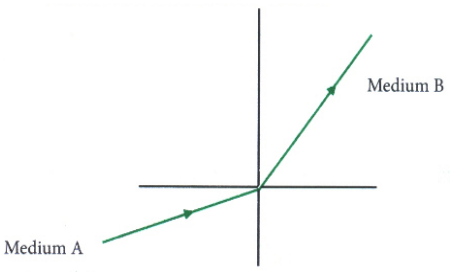
(c) between the focus and centre of curvature of the reflector (d) at the centre of curvature of the reflector.

8) In which of the following, the image of an object placed at infinity will be highly diminished and point sized?

(a) Concave mirror only (b) Convex mirror only (c) Convex lens only

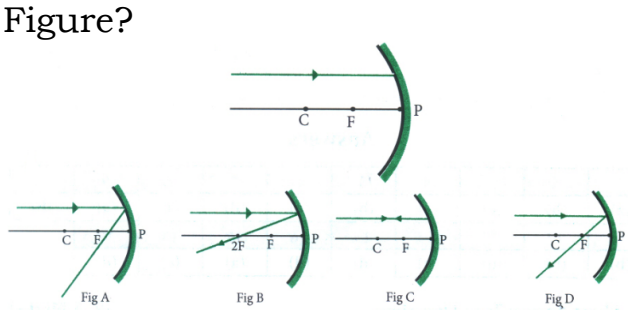
(d) Concave mirror, convex mirror, concave lens and convex lens

9) A light ray enters from medium A to medium B as shown in Figure. The refractive index of medium B relative to A will be



(a) greater than unity (b) less than unity (c) equal to unity (d) zero

10) Which of the following ray diagrams is correct for the ray of light incident on a concave mirror as shown in Figure?



(a) Fig. A (b) Fig. B (c) Fig. C (d) Fig. D

11) Image formed by plane mirror is

(a) real and erect (b) real and inverted (c) virtual and erect (d) virtual and inverted

12) All the distances in case of spherical mirror are measured in relation

(a) object to image (b) the pole of the mirror (c) the focus of the mirror (d) the image to the object.

13) The optical phenomena, twinkling of stars, is due to

(a) atmospheric reflection (b) total reflection (c) atmospheric refraction (d) total refraction

14) The refractive indices of some media are given below

MEedium	Refractive index
X	1.51
y	1.72
Z	1.83
W	2.42

In which of these is the speed of light minimum and maximum, respectively

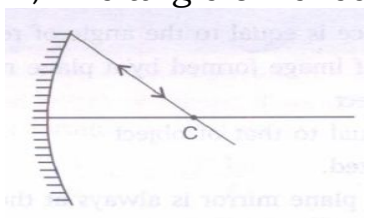
(a) X-minimum, W-maximu (b) Z-minimum, W-maximum (c) W-minimum, X-maximum

(d) X-minimum, Z-maximum

15) An incident ray makes 60° angle with the surface of the plane mirror, the angle of its reflection is

(a) 60° (b) 90° (c) 30° (d) 0°

16) The angle of reflection in the given figure is



(a) 90° (b) 180° (c) 0° (d) 30°

4 x 1 = 4

17) **Assertion:** A convex lens of short focal length bends the light rays through large angles.

Reason: This helps in by focusing the light closer to the optical centre.

Codes

(a) If both assertion and reason are true and the reason is correct explanation of assertion.
(b) If both assertion and reason are true but reason is not a correct explanation of assertion. -.
(c) If assertion is true and reason is false.
(d) If both assertion and reason are false.

18) **Assertion:** The extent of refraction is different for different medium.

Reason: Different medium have different refractive index.

Codes

(a) If both assertion and reason are true and the reason is correct explanation of assertion.
(b) If both assertion and reason are true but reason is not a correct explanation of assertion. -.
(c) If assertion is true and reason is false.
(d) If both assertion and reason are false.

19) **Assertion:** Parallel rays meet at focus after refraction.

Reason: Rays from distant objects are parallel rays.

Codes

(a) If both assertion and reason are true and the reason is correct explanation of assertion.
(b) If both assertion and reason are true but reason is not a correct explanation of assertion.
(c) If assertion is true and reason is false.
(d) If both assertion and reason are false.

20) **Assertion:** Linear magnification of a mirror has no unit.

Reason: The ratio of height of the image to the height of the object is the linear magnification produced by mirror.

Codes

(a) Both A and R are true, and R is correct explanation of the assertion.
(b) Both A and R are true, but R is not the correct explanation of the assertion.
(c) A is true, but R is false.
(d) A is false, but R is true

7 x 2 = 14

21) A ray of light travelling in air enters obliquely into water.Does the light ray bend towards the normal or from the normal?Why?

22) Define 1 dioptre of power of a lens.

23) Find the focal length of a lens of power - 2.0 D. What type of lens is this?

24) A doctor has prescribed a corrective lens of power + 1.5 D. Find the focal length of the lens. Is the prescribed lens diverging or converging?

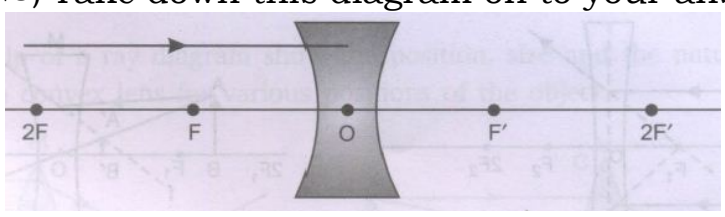
25) Find the power of a concave lens of focal length 2m.

26) Draw a ray diagram to show the path of the reflected ray corresponding to an incident ray which is directed towards the principal focus of a convex mirror. Mark on the angle of incidence and the angle of reflection.

27) An object of height 4 cm is kept at a distance of 30 cm from a concave lens. Use lens formula to determine the image distance, nature and size of the image formed if focal length of the lens is 15 cm.

4 x 3 = 12

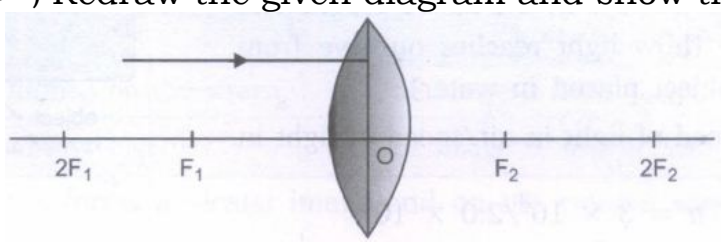
28) Take down this diagram on to your answer book and complete the path of the ray.



29) If the image formed by a lens for all positions of the object placed in front of it is always virtual, erect and diminished, state the type of the lens. Draw a ray diagram in support of your answer. If the numerical value of focal length of such a lens is 20 cm, find its power in new cartesian sign conventions.

30) A 4 cm tall object is placed perpendicular to the principal axis of a convex lens of focal length 24 cm. The distance of the object from the lens is 16 cm. Find the position, size and nature of the image formed, using the lens formula

31) Redraw the given diagram and show the path of refracted ray.



3 x 5 = 15

32) An object of size 7.0 cm is placed at 27 cm in front of a concave mirror of focal length 18 cm. At what distance from the mirror should a screen be placed, so that a sharp focused image can be obtained? Find the size and the nature of the image.

33) Define power of a lens. What is its unit? One student uses a lens of focal length 50 cm and another of - 50 cm. What is the nature of the lens and its power used by each of them?

34) (a) Define focal length of a spherical lens.

(b) A divergent lens has a focal length of 30 cm. At what distance should an object of height 5 cm from the optical centre of the lens be placed so that its image is formed 15 cm away from the lens? Find the size of the image also.

(c) Draw a ray diagram to show the formation of image in the above situation.