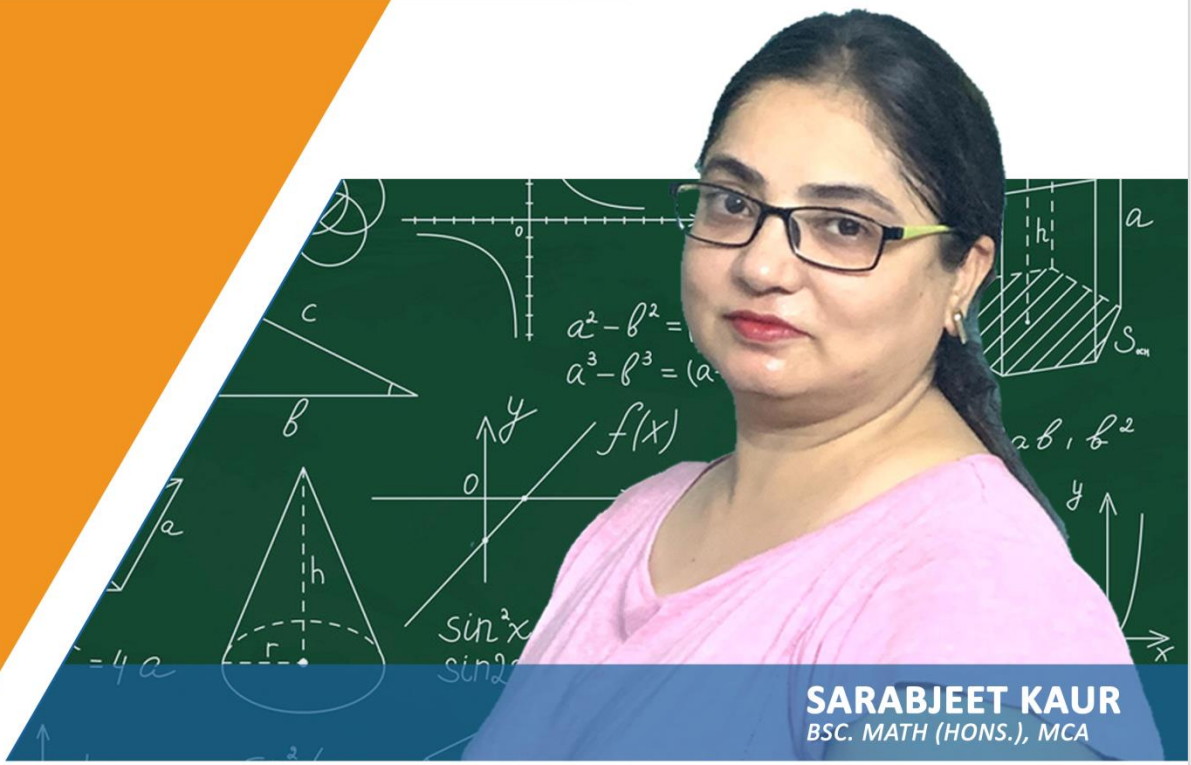
CAREER+ ACADEMY



SARABJEET KAUR
BSC. MATH (HONS.), MCA

GRADE 10TH SCIENCE

CHAPTER 10

Light-Reflection and Refraction

www.careerplusacademy.com careerplusacademy@gmail.com

/careerplusacademy /in/sarabkaur /careerplusacademy +91-987-111-5373

MULTIPLE CHOICE QUESTIONS [1 Mark]

1. The bending of a beam of light when it passes obliquely from one medium to another is known as _____.

1. reflection
2. refraction
3. dispersion
4. deviation

2. The part of the lens through which the ray of light passes without suffering deviation is called _____.

1. optical centre
2. focus
3. centre of curvature
4. pole

3. Convex lens always gives a real image if the object is situated beyond _____

1. optical centre
2. centre of curvature
3. Focus
4. radius of curvature

4. Parallel rays of light entering a convex lens always converge at _____.

1. centre of curvature
2. the principal focus
3. optical centre
4. the focal plane

5. Where should an object be placed so that a real and inverted image of the same size is obtained, using a convex lens?

1. Between O and F
2. At F
3. At 2 F
4. At infinity

6. SI unit of the power of a lens is _____.

1. dioptre
2. cm
3. metre
4. watt

7. 1 D is the power of the lens of focal length of _____ cm.

1. 100
2. 10
3. 1/100
4. 1/10

8. In a simple microscope lens used is _____.

1. biconvex
2. biconcave
3. plano convex
4. cylindrical

9. Reciprocal of focal length in metres is known as the _____ of a lens.

1. focus
2. power
3. power of accommodation
4. far point

10. A convex lens is called _____.

1. converging lens
2. diverging lens
3. both converging and diverging lens
4. refracting lens

11. A positive magnification greater than unity indicates _____.

1. real image
2. virtual image
3. neither real not virtual image
4. distorted image

12. The power of a convex lens of focal length 50 cm is _____.

1. + 2D
2. - 2D
3. 50 D
4. - 5D

13. The focal length of a lens whose power is -1.5 D is _____.
1. -66.66 cm
2. + 1.5 m
3. + 66.66 cm
4. -1.5 m

14. Real images formed by single convex lenses are always _____.
1. on the same side of the lens as the object
2. Inverted
3. Erect
4. smaller than the object

15. An object is placed 12 cm from a convex lens whose focal length is 10 cm. The image must be.
1. virtual and enlarged
2. virtual and reduced in size
3. real and reduced in size
4. real and enlarged

16. When a person uses a convex lens as a simple magnifying glass, the object must be placed at a distance.
1. less than one focal length
2. more than one focal length
3. less than twice the focal length
4. more than twice the focal length

17. The image produced by a concave lens is _____.
1. always virtual and enlarged
2. always virtual and reduced in size
3. always real
4. sometimes real, sometimes virtual

18. A virtual image is formed by _____.
1. a slide projector in a cinema hall
2. the ordinary camera
3. a simple microscope
4. Telescope

19. An object is placed 25 cm from a convex lens whose focal length is 10 cm. The image distance is _____ cm.

1. 50 cm
2. 16.66 cm
3. 6.66 cm
4. 10 cm

20. The least distance of distinct vision is _____.

1. 25 cm
2. 25 m
3. 0.25 cm
4. 2.5 m

21. A convex lens has a focal length of 20 cm. Its power in dioptres is _____.

1. 2
2. 5
3. 0.5
4. 0.2

22. An object is placed before a concave lens. The image formed _____-.

1. is always erect
2. may be erect or inverted
3. is always inverted
4. is always real

23. A ray of light travels from a medium of refractive index n_1 to a medium of refractive index n_2. If angle of incidence is i and the angle of refraction is r, then $\frac{\sin i}{\sin r}$ is equal to

1. n_1
2. n_2
3. n_{21}
4. n_{12}

24. Two thin lenses of power +5 D and -2 D are placed in contact with each other. Focal length of the combination is

1. +3 m
2. -3 m
3. 0.33 m
4. -0.33 m

25. The lens formula in cartesian frame is _____.

1. $\frac{1}{f}=\frac{1}{u}+\frac{1}{v}$
2. $\frac{1}{f}=\frac{1}{u}-\frac{1}{v}$
3. $\frac{1}{f}=\frac{1}{v}-\frac{1}{u}$
4. $\frac{1}{f}=-\frac{1}{v}-\frac{1}{u}$

26. To obtain magnified erect image on a concave mirror, object should be held
a) At pole b) At focus c) Between p and f d) Beyond 2f

27. If f is the focal length and R is the radius of curvature of a spherical mirror, then
a) R=f b) R=2f c) R=3f d) R=4f

28. The image formed by a concave mirror is real, inverted and of same size as that of the object. The position of the object is
a) At C b) At F c) Between C and F d) Beyond C

29. The image formed by a concave mirror is virtual, erect and magnified. The position of the object is
a) At F b) At c c) At infinity d) Between P and F

30. The image formed by a spherical mirror is virtual, erect and smaller in size. Whatever be the position of the object. The mirror is
a) Convex b) Concave c) Either convex or concave d) Cannot say

31. When light goes from one medium to another, the characteristics that remain unaffected is
a) Speed b) Direction c) Wave length d) Frequency

32. Reflective index of glass w.r.t air is 3/2. What is the refractive index of air w.r.t glass?
a) 2/3 b) 1 c) Zero d) (3/2)2

33. A convex lens of focal length 15 cm is used to form an image of the size of the object. Where from the lens should be the object is placed.
a) 15 cm b) 30 cm c) 60 cm d) 10 cm

34. To form an image twice the size of the object, using a convex lens of focal length 20 cm, the object distance must be
a) <20 cm b) >20 cm
c) <20 cm and between 20 cm and 40 cm d) Cannot say

35. Bending of a ray of light due to change in velocity with medium is called
a) Reflection b) Refraction c) Diffraction d) Dispersion

36. If correct value of refractive index of a medium(μ) in terms of velocity of light in vacuum (C) and velocity of light in medium (v) is
a) n = vC b)n = 1 / ve c)n= C / v d) n = v / C.

37. Total internal reflection takes place when light travels
a) From denser to rarer medium
b) From rarer to denser medium
c) In same denser medium from one side to other.
d) In same rarer medium from one side to other.

38. For no bending of a ray of light through a glass slab, angle of incidence must be
a) 0^0 b) 30^0 c) 60^0 d) 90^0

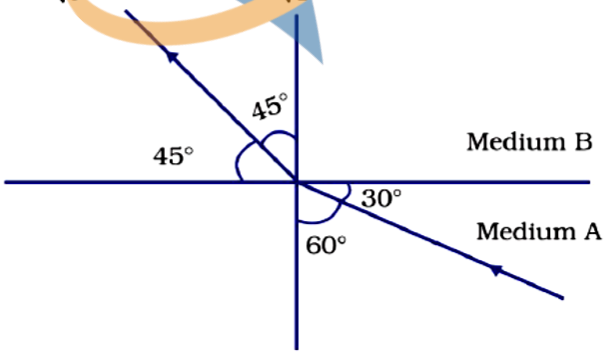
39. A convex lens is
a) Thin in the middle, thick at the room. b) Thick in the middle, thin at the rim.
c) Thick through out. d) Thin throughout.

40. Power of convex lens is
a) Zero. b) Infinite. c) Positive d) Negative.

41. Which of the following can make a parallel beam of light when light from a point source is incident on it?
(a) Concave mirror as well as convex lens
(b) Convex mirror as well as concave lens
(c) Two plane mirrors placed at 90° to each other
(d) Concave mirror as well as concave lens

42. A 10 mm long awl pin is placed vertically in front of a concave mirror. A 5 mm long image of the awl pin is formed at 30 cm in front of the mirror. The focal length of this mirror is
(a) – 30 cm (b) – 20 cm (c) – 40 cm (d) – 60 cm

43. The below Figure shows a ray of light as it travels from medium A to medium B. Refractive index of the medium B relative to medium A is
(a) $\frac{\sqrt{3}}{\sqrt{2}}$ (b) $\frac{\sqrt{2}}{\sqrt{3}}$ (c) $\frac{1}{\sqrt{2}}$ (d) $\sqrt{2}$

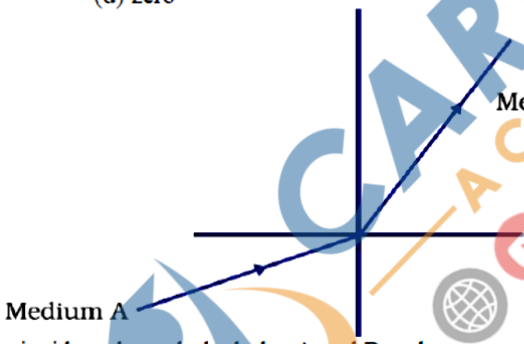


44. Which of the following statements is true?
(a) A convex lens has 4 dioptre power having a focal length 0.25 m
(b) A convex lens has –4 dioptre power having a focal length 0.25 m
(c) A concave lens has 4 dioptre power having a focal length 0.25 m
(d) A concave lens has –4 dioptre power having a focal length 0.25 m

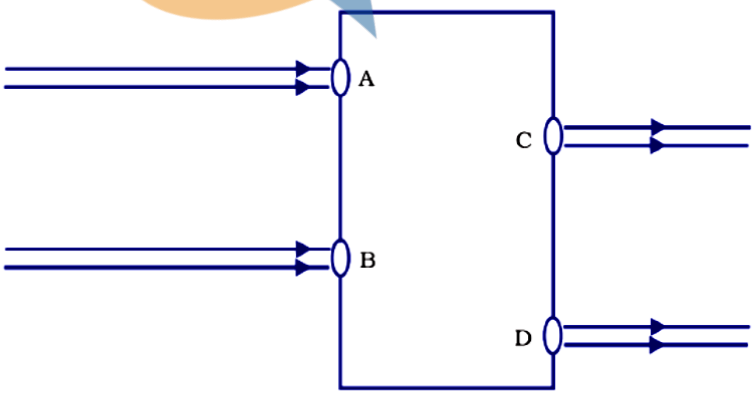
45. Under which of the following conditions a concave mirror can form an image larger than the actual object?
(a) When the object is kept at a distance equal to its radius of curvature
(b) When object is kept at a distance less than its focal length
(c) When object is placed between the focus and centre of curvature
(d) When object is kept at a distance greater than its radius of curvature

46. Magnification produced by a rear view mirror fitted in vehicles
(a) is less than one
(b) is more than one
(c) is equal to one
(d) can be more than or less than one depending upon the position of the object in front of it

47. A light ray enters from medium A to medium B as shown in below 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



48. Beams of light are incident through the holes A and B and emerge out of box through the holes C and D respectively as shown in the below Figure. Which of the following could be inside the box?
(a) A rectangular glass slab (b) A convex lens
(c) A concave lens (d) A prism

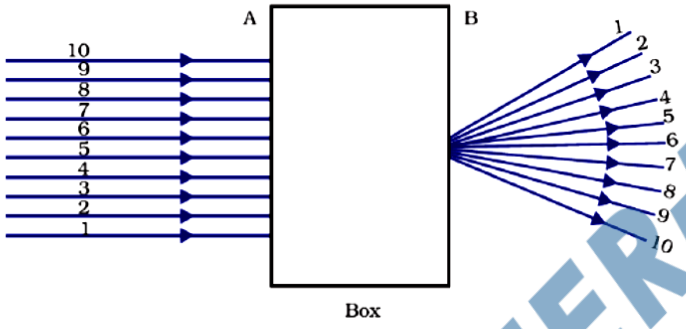


Box

49. A full length image of a distant tall building can definitely be seen by using
(a) a concave mirror (b) a convex mirror
(c) a plane mirror (d) both concave as well as plane mirror

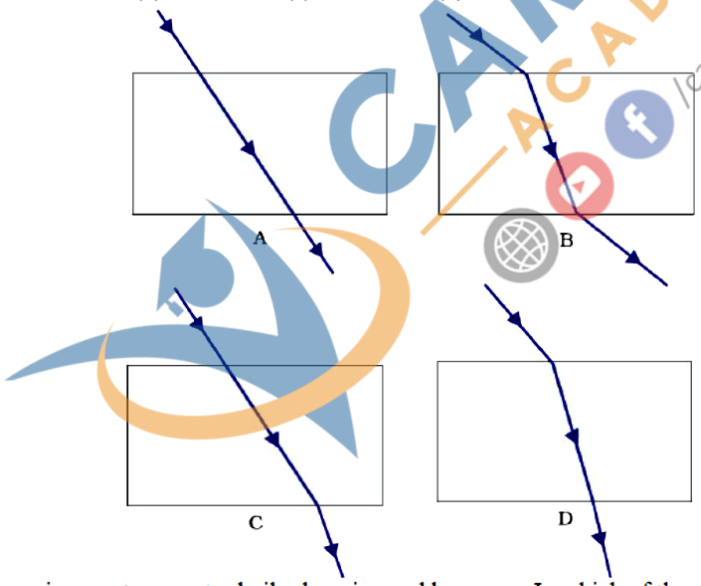
50. A beam of light is incident through the holes on side A and emerges out of the holes on the other face of the box as shown in the below Figure. Which of the following could be inside the box?

(a) Concave lens (b) Rectangular glass slab
(c) Prism (d) Convex lens



51. The path of a ray of light coming from air passing through a rectangular glass slab traced by four students are shown as A, B, C and D in Figure. Which one of them is correct?

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



52. You are given water, mustard oil, glycerine and kerosene. In which of these media a ray of light incident obliquely at same angle would bend the most?

(a) Kerosene (b) Water
(c) Mustard oil (d) Glycerine

53. A child is standing in front of a magic mirror. She finds the image of her head bigger, the middle portion of her body of the same size and that of the legs smaller. The following is the order of combinations for the magic mirror from the top.

(a) Plane, convex and concave
(b) Convex, concave and plane
(c) Concave, plane and convex
(d) Convex, plane and concave

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

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

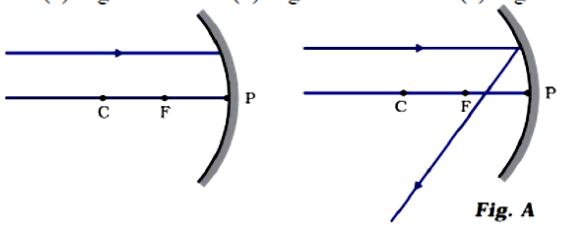


Fig. A

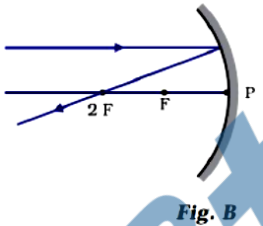


Fig. B

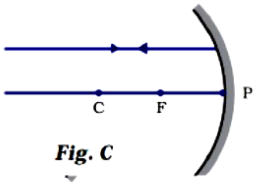


Fig. C

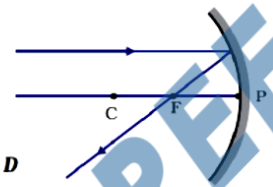
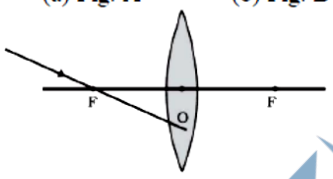


Fig. D

55. Which of the following ray diagrams is correct for the ray of light incident on a lens shown in below Figure?

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



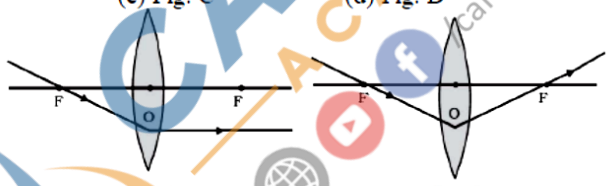


Fig. A *Fig. B*

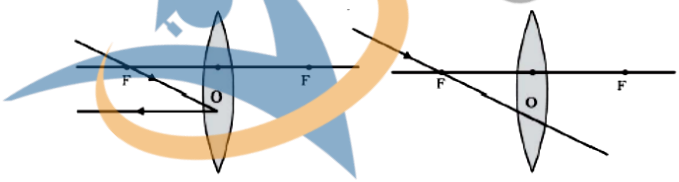


Fig. C *Fig. D*

56. Rays from Sun converge 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) 15 cm in front of the mirror
(b) 30 cm in front of the mirror
(c) between 15 cm and 30 cm in front of the mirror
(d) more than 30 cm in front of the mirror

57. 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

58. The laws of reflection hold good for

(a) plane mirror only (b) concave mirror only
(c) convex mirror only (d) all mirrors irrespective of their shape

59. 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

60. The linear magnification produced by a convex mirror is always positive. This is because
(a) Convex mirror is a small mirror.
(b) Image formed by a convex mirror is always smaller in size than the object.
(c) Image formed by a convex mirror is real.
(d) Image formed by a convex mirror is always virtual and erect.

61. In which of the following mirrors, image of an object is always virtual, erect and smaller in size than the size of object?
(a) convex mirror
(b) concave mirror
(c) plane mirror
(d) none of the these

62. A boy runs towards a plane mirror with a velocity of 2m/s. With what speed will her image move towards him?
(a) 2m/s
(b) 0
(c) 4m/s
(d) none of the these

63. The linear magnification of the concave lens is always positive but less than one. This is because
(a) concave lens forms real images only.
(b) concave lens forms virtual images only.
(c) concave lens forms virtual, erect and diminished images irrespective of the position of the object.
(d) none of the these

64. The linear magnification of the concave lens is – 1, when object is kept at
(a) at infinity
(b) at focus
(c) at $2F_1$
(d) between F_1 and $2F_1$.

65. The focal length of the combination of convex lens of power 1D and concave lens of power – 1.5 D is
(a) – 2 m (b) 2 m
(c) 2.5 m (d) 0.5 m