CHAPTER : LIGHT

1. The focal length of a plane mirror is:
   a) Infinite
   b) Zero
   c) 1 m
   d) –1 m
   Ans: a

2. Which mirror is used in rear-view mirrors of vehicles?
   a) Plane mirror
   b) Concave mirror
   c) Convex mirror
   d) None
   Ans: c

3. The image formed by a concave mirror is real only when the object is placed:
   a) Between pole and focus
   b) Between focus and centre of curvature
   c) Beyond focus
   d) At infinity
   Ans: c

4. A convex mirror always forms an image which is:
   a) Real, inverted, diminished
   b) Virtual, erect, diminished
   c) Real, erect, magnified
   d) Virtual, inverted, magnified
   Ans: b

5. The mirror formula is:
   a) $1/f = 1/v + 1/u$
   b) $1/f = 1/v – 1/u$
   c) $f = v – u$
   d) $v = u + f$
   Ans: a

6. A ray of light parallel to principal axis after reflection from concave mirror passes through:
   a) Pole
   b) Centre of curvature
   c) Focus
   d) None
   Ans: c

7. The bending of light ray at the interface between two media is called:
   a) Reflection
   b) Refraction
   c) Dispersion
   d) Scattering
   Ans: b

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8. The refractive index of medium is defined as:
   a) sin i / sin r
   b) c / v
   c) Both (a) and (b)
   d) None
   Ans: c

9. Lens formula is:
   a) 1/f = 1/v + 1/u
   b) 1/f = 1/v – 1/u
   c) v = fu / (u – f)
   d) All of these
   Ans: d

10. Which lens is used in a simple microscope?
   a) Convex lens
   b) Concave lens
   c) Cylindrical lens
   d) Plano-concave lens
   Ans: a
11. The focal length of a concave mirror is positive when:
   a) Object is real
   b) Mirror is convex
   c) Mirror is concave
   d) Image is virtual
   Ans: c

12. Which of the following can produce a real image?
   a) Plane mirror
   b) Convex lens
   c) Concave lens
   d) None
   Ans: b

13. The unit of power of a lens is:
   a) Watt
   b) Joule
   c) Dioptre
   d) Hertz
   Ans: c

14. A concave mirror is also called:
   a) Converging mirror
   b) Diverging mirror
   c) Plane mirror
   d) Cylindrical mirror
   Ans: a

15. The mirror which always forms a virtual, erect and diminished image:
   a) Concave
   b) Convex
   c) Plane
   d) None

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Ans: b

16. For a concave mirror, if object is at infinity, image is formed:
    a) At focus
    b) At centre of curvature
    c) Between F and C
    d) At infinity
    Ans: a

17. Which law is same for reflection and refraction?
    a) Law of reflection
    b) Snell's law
    c) Incident ray, refracted ray, normal all lie in same plane
    d) None
    Ans: c

18. The refractive index of a medium depends on:
    a) Speed of light in medium
    b) Speed of light in vacuum
    c) Nature of medium
    d) All of these
    Ans: d

19. The path of light when it goes from rarer to denser medium:
    a) Bends towards normal
    b) Bends away from normal
    c) No bending
    d) Totally reflected
    Ans: a

20. Which lens can never form a real image?
    a) Convex
    b) Concave
    c) Both convex and concave
    d) None
    Ans: b

21. Absolute refractive index of vacuum is:
    a) 1
    b) 0
    c) Infinite
    d) 3×10^{8}
    Ans: a

22. Convex lens is also called:
    a) Converging lens
    b) Diverging lens
    c) Cylindrical lens
    d) None
    Ans: a

23. Concave lens is also called:
    a) Converging lens

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b) Diverging lens
c) Plano-convex lens
d) None
Ans: b

24. A parallel beam of light after refraction through convex lens converges at:
a) Pole
b) Centre of curvature
c) Focus
d) Optical centre
Ans: c

25. A plane mirror always forms an image which is:
a) Real, inverted, diminished
b) Virtual, erect, same size
c) Real, erect, magnified
d) Virtual, inverted, magnified
Ans: b

26. The power of a lens is:
a) Reciprocal of focal length in cm
b) Reciprocal of focal length in m
c) Equal to focal length
d) None
Ans: b

27. Which of the following is a converging device?
a) Concave lens
b) Convex mirror
c) Convex lens
d) Plane mirror
Ans: c

28. A concave mirror is used by dentists because:
a) It gives magnified virtual image
b) It gives diminished real image
c) It gives erect real image
d) None
Ans: a

29. A convex lens of focal length 20 cm has power:
a) 5 D
b) 4 D
c) 3 D
d) 2 D
Ans: b

30. If refractive index of water is 4/3, velocity of light in water is:
a) 2.25×10^8 m/s
b) 3×10^8 m/s
c) 4×10^8 m/s
d) 1×10^8 m/s
Ans: a

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31. A concave mirror has focal length 20 cm. An object is placed at 30 cm. Image distance = ?
    a) 60 cm
    b) 30 cm
    c) 15 cm
    d) 40 cm
    Ans: a

32. A convex mirror has focal length 15 cm. An object 10 cm from mirror. Position of image = ?
    a) –6 cm
    b) –10 cm
    c) –30 cm
    d) –60 cm
    Ans: a

33. An object is 36 cm in front of concave mirror, focal length 12 cm. Magnification = ?
    a) –1
    b) –2
    c) –3
    d) –4
    Ans: c

34. A convex lens has focal length 10 cm. Object at 20 cm. Image distance = ?
    a) 20 cm
    b) 30 cm
    c) 40 cm
    d) 15 cm
    Ans: a

35. In Q34, magnification = ?
    a) –1
    b) –2
    c) –3
    d) –0.5
    Ans: a

36. A concave lens has focal length 30 cm. An object is placed 60 cm in front. Image distance = ?
    a) –20 cm
    b) –30 cm
    c) –15 cm
    d) –10 cm
    Ans: c

37. A glass slab of thickness 6 cm, refractive index 1.5. Shift produced = ?
    a) 2 cm
    b) 3 cm
    c) 4 cm
    d) 5 cm
    Ans: b

38. A ray enters glass from air with i = 60°, r = 30°. Refractive index = ?
    a) 1.5
    b) 1.73
    c) 1.33

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d) 2.0
Ans: b

39. A concave mirror of radius 40 cm forms image at 30 cm. Object distance = ?
a) 60 cm
b) 20 cm
c) 40 cm
d) 10 cm
Ans: a

40. A convex lens of focal length 15 cm. Object at 10 cm. Image distance = ?
a) –30 cm
b) –15 cm
c) –10 cm
d) –20 cm
Ans: a

41. An object is at 24 cm from concave lens of focal length 12 cm. Image distance = ?
a) –8 cm
b) –12 cm
c) –6 cm
d) –18 cm
Ans: a

42. Focal length of convex lens is 25 cm. Object is at 50 cm. Image distance = ?
a) 25 cm
b) 50 cm
c) 75 cm
d) 100 cm
Ans: a

43. In Q42, magnification = ?
a) –1
b) –0.5
c) –2
d) +2
Ans: b

44. A concave mirror forms real image 4 times size of object at distance 20 cm. Focal length = ?
a) 16 cm
b) 12 cm
c) 25 cm
d) 15 cm
Ans: a

45. A convex lens has focal length 20 cm. Image formed at 40 cm. Object distance = ?
a) 20 cm
b) 40 cm
c) 60 cm
d) 30 cm
Ans: d

46. A 5 cm tall object is placed at 30 cm from concave mirror f = 15 cm. Height of image = ?
a) 5 cm

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b) 10 cm
c) 15 cm
d) 20 cm
Ans: b

47. Power of concave lens of focal length 50 cm = ?
a) –1 D
b) –2 D
c) –3 D
d) –0.5 D
Ans: b

48. Power of convex lens of focal length 40 cm = ?
a) +2.5 D
b) +3 D
c) +2 D
d) +1.5 D
Ans: a

49. Radius of curvature of concave mirror is 30 cm. Its focal length = ?
a) 15 cm
b) 30 cm
c) 60 cm
d) 10 cm
Ans: a

50. Radius of curvature of convex lens surface = 20 cm. Refractive index = 1.5. Focal length ≈ ?
a) 10 cm
b) 20 cm
c) 40 cm
d) 30 cm
Ans: b

51. Light enters glass with velocity 2×10^{8} m/s. Refractive index = ?
a) 1.5
b) 1.33
c) 2.0
d) 1.25
Ans: a

52. A coin at depth 12 cm appears 9 cm below. Refractive index = ?
a) 1.25
b) 1.33
c) 1.5
d) 2.0
Ans: c

53. A convex lens produces image equal to object. Object distance = ?
a) f
b) 2f
c) ∞
d) f/2

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Ans: b

54. Critical angle for diamond = 24°. RI = ?
    a) 2.42
    b) 1.5
    c) 1.33
    d) 1.73
    Ans: a

55. A convex lens has f = 10 cm. Object at 15 cm. Image magnification = ?
    a) –2
    b) –3
    c) –1.5
    d) –0.5
    Ans: c

56. Focal length of lens is 50 cm. Power = ?
    a) 0.5 D
    b) 2 D
    c) 1 D
    d) 5 D
    Ans: b

57. Concave mirror forms image at 30 cm for object at 15 cm. Focal length = ?
    a) 10 cm
    b) 15 cm
    c) 20 cm
    d) 25 cm
    Ans: b

58. Light takes 2×10^{-8} s to cross glass slab of thickness 6 m. Speed of light in glass = ?
    a) 3×10^{8} m/s
    b) 2.5×10^{8} m/s
    c) 3×10^{7} m/s
    d) 2.5×10^{7} m/s
    Ans: c

59. Object is at 10 cm from concave mirror f = 15 cm. Image distance = ?
    a) –30 cm
    b) –20 cm
    c) +30 cm
    d) +20 cm
    Ans: b

60. A convex lens f = 12 cm forms real image at 24 cm. Object distance = ?
    a) 8 cm
    b) 18 cm
    c) 12 cm
    d) 24 cm
    Ans: b

61. The nature of image when object placed between F and pole of concave mirror:
    a) Real, inverted, diminished

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b) Virtual, erect, magnified
c) Real, erect, magnified
d) Virtual, inverted, diminished
Ans: b

62. A ray parallel to principal axis after refraction from convex lens passes through:
a) Centre of curvature
b) Optical centre
c) Principal focus
d) Pole
Ans: c

63. A ray passing through optical centre of a lens emerges:
a) Deviated
b) Parallel to principal axis
c) Undeviated
d) Reflected
Ans: c

64. In ray diagram of convex lens, object beyond 2F gives image:
a) Real, inverted, diminished
b) Real, inverted, magnified
c) Virtual, erect, magnified
d) At infinity
Ans: a

65. In concave lens ray diagram, image formed is always:
a) Real, inverted
b) Virtual, erect
c) Real, erect
d) None
Ans: b

66. In convex lens ray diagram, object at F gives image at:
a) C
b) Infinity
c) Between F and 2F
d) Optical centre
Ans: b

67. In convex lens ray diagram, object at 2F gives image at:
a) F
b) 2F
c) Beyond 2F
d) Infinity
Ans: b

68. In concave mirror diagram, object beyond C gives image:
a) Real, inverted, diminished
b) Real, erect, diminished
c) Virtual, erect, magnified
d) Virtual, inverted, diminished
Ans: a

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69. In convex lens diagram, object at infinity gives image:
a) At 2F
b) At F
c) At infinity
d) At optical centre
Ans: b

70. In concave mirror diagram, object at F gives image:
a) At pole
b) At infinity
c) At C
d) Between F and C
Ans: b

71. Concave mirror image is always inverted except when:
a) Object between F and pole
b) Object at infinity
c) Object at F
d) Object beyond C
Ans: a

72. Convex mirror always forms:
a) Real, inverted image
b) Virtual, erect image
c) Real, magnified image
d) Virtual, inverted image
Ans: b

73. For convex lens, when object between F and lens, image is:
a) Real, inverted, diminished
b) Virtual, erect, magnified
c) Virtual, inverted, diminished
d) None
Ans: b

74. In concave lens diagram, ray parallel to axis passes through:
a) Pole
b) Focus on same side
c) Focus on opposite side
d) Centre of curvature
Ans: c

75. In convex lens diagram, ray through optical centre emerges:
a) Parallel
b) Undeviated
c) Through focus
d) Reflected
Ans: b

76. A concave mirror produces image of same size as object when placed at:
a) F
b) 2F (C)
c) Between F and C

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d) Infinity
Ans: b

77. A convex lens makes a real image twice size of object at 60 cm from lens. Focal length = ?
a) 20 cm
b) 30 cm
c) 40 cm
d) 60 cm
Ans: b

78. A coin at bottom of tank appears raised by 2 cm. If depth = 10 cm, refractive index = ?
a) 1.25
b) 1.33
c) 1.5
d) 2.0
Ans: b

79. Critical angle for a glass-air surface is 42°. RI of glass = ?
a) 1.33
b) 1.41
c) 1.5
d) 1.73
Ans: c

80. A concave lens always forms image that is:
a) Real, inverted, diminished
b) Virtual, erect, diminished
c) Virtual, inverted, magnified
d) None
Ans: b

81. A convex lens of power +5 D has focal length = ?
a) 5 cm
b) 10 cm
c) 20 cm
d) 25 cm
Ans: d

82. A concave lens of power –2 D has focal length = ?
a) –25 cm
b) –50 cm
c) –100 cm
d) –200 cm
Ans: b

83. A person uses concave lens of focal length 50 cm. Power = ?
a) +2 D
b) –2 D
c) –0.5 D
d) +0.5 D
Ans: b

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84. The magnification of plane mirror is:
a) +1
b) –1
c) 0
d) Infinite
Ans: a

85. If an object is shifted from focus to centre of curvature of concave mirror, its image:
a) Moves from infinity to centre of curvature
b) Moves from infinity to pole
c) Moves from C to F
d) Moves from C to pole
Ans: a

86. If object is at 10 cm from convex lens of f = 15 cm, position of image = ?
a) –30 cm
b) –10 cm
c) –20 cm
d) –15 cm
Ans: a

87. A lens has power +2 D. Nature of lens = ?
a) Convex
b) Concave
c) Plane
d) None
Ans: a

88. A concave mirror of f = 20 cm produces image double size of object. Object distance = ?
a) 10 cm
b) 20 cm
c) 30 cm
d) 40 cm
Ans: c

89. A convex lens produces virtual image of 2× magnification when object is placed at:
a) 2f
b) Between F and O
c) At F
d) Beyond 2f
Ans: b

90. A light ray enters glass from air at 45°, emerges undeviated. Possible only if:
a) Glass has RI = 1
b) Glass has RI = 0
c) Glass has RI = ∞
d) None
Ans: a

91. The apparent depth of swimming pool is 1.5 m, real depth is 2 m. RI of water = ?
a) 1.33
b) 1.25
c) 1.5

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d) 1.42
Ans: a

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