

Light reflection and refraction important MCQs – cbsephysics.com

[Answers are highlighted as bold]

1. For a real object, which of the following can produce a Virtual, Erect and Same size image?

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

2. Which of the following mirror is used to examine a small letter while reading?

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

3. An object at a distance of + 16 cm is slowly moved towards the pole of a convex mirror. The image will get

- (a) shortened and real
- (b) enlarged and real
- (c) enlarge and virtual
- (d) **diminished and virtual**

4. A concave mirror of radius 20 cm is placed in water. It's focal length in air and water differ by

- (a) 40
- (b) 20
- (c) None of these
- (d) 0

5. Focal length of plane mirror is

- a. **Infinity**
- b. Zero
- c. Negative
- d. None of these

6. A concave mirror gives real, inverted and same size image if the object is placed

- a. At F
- b. At infinity
- c. **At C**
- d. Beyond C

7. Convex lens focus a real, point sized image at focus, the object is placed

- a. At focus
- b. None of these
- c. **At infinity**

d. At 2F

8. A divergent lens will produce-

- (a) always real image
- (b) always virtual image**
- (c) both real and virtual image
- (d) none of these

9. The angle of incidence i and refraction r are equal in a transparent slab when the value of i becomes

- (a) 0°**
- (b) 45°
- (c) 90°
- (d) depend on the material of the slab

10. Large number of thin strips of black paint are made on the surface of a convex lens of focal length 20 cm to catch the image of a white horse. The image will be

- (a) a zebra of black stripes
- (b) a horse of black stripes
- (c) a horse of less brightness**
- (d) None of these

11. The refractive index of transparent medium is greater than one because

- (a) Speed of light in vacuum $<$ speed of light in transparent medium
- (b) None of these**
- (c) Speed of light in vacuum = speed of light in transparent medium
- (d) Frequency of light wave changes when it moves from rarer to denser medium\

12. A concave mirror of focal length 20 cm forms an image having twice the size of object. For a virtual position of object, the position of object will be at

Answer: - 10 cm

13. As light travels from one medium to another medium it will have

- (a) increased velocity
- (b) decreased velocity
- (c) depends on the refractive index.**
- (d) both (a) and (b)

14. A spherical mirror and thin spherical lens have each of focal length of -15 cm. the mirror and 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 and lens is concave.

15. If an incident ray passes through the focus, the reflected ray will

- (a) pass through the pole

(b) parallel to the principal axis

(c) retrace its path

(d) pass through the centre of curvature

16. Assertion: The rainbow is refraction spectrum of sunlight in the sky.

Reason: The rainbow is formed in the sky when the sun is shining and it is raining at the same time.

(a) Both A and R are true and R is the correct explanation of A.

(b) Both A and R are true but R is not the correct explanation of A.

(c) A is true but R is false.

(d) A is false but R is true.

(e) Both A and R are false.

17. Assertion: Star is twinkling but planet not.

Reason: The density of atmosphere is changing continuously.

(a) Both A and R are true and R is the correct explanation of A.

(b) Both A and R are true but R is not the correct explanation of A.

(c) A is true but R is false.

(d) A is false but R is true.

(e) Both A and R are false.

18. Assertion: Pupil is black in colour.

Reason: Pupil is black in colour as no light is reflected in it.

(a) Both A and R are true and R is the correct explanation of A.

(b) Both A and R are true but R is not the correct explanation of A.

(c) A is true but R is false.

(d) A is false but R is true.

19. Coin placed in a bowl when seen from a place just disappears. When water is poured into the bowl without disturbing the coin, the coin

(a) Will not be seen

(b) Becomes visible again

(c) Appears above the water surface

(d) Appears very much deep inside the water

20. Nature of the image formed by a convex mirror is -

a. Real, inverted, diminished

b. Real, inverted, enlarged

c. virtual, erect, diminished

d. Virtual, erect, enlarged

21. The property of a mirror used in burning a paper is

a. Rays from an object placed at a large distance in a concave mirror after reflection forms the image at the Focus

b. Rays from an object placed at a large distance in a convex mirror after reflection forms the image at the Focus

c. Rays from an object placed at Focus after reflection in a concave mirror forms the image at a very large distance.

d. Rays from an object placed between F and 2F in a concave mirror after reflection forms the image beyond the Focus

22. The power of a lens is -3.5D. The lens is -

- a. Convex
- b. concave**
- c. Plano-convex
- d. Plano-concave

23. Formula to find the refractive index of a medium is

- a. $n = \text{speed of light in the medium} / \text{speed of light in air}$
- b. $n = 1 / \text{speed of light in air}$
- c. $n = \text{speed of light in the air} / \text{speed of light in the medium}$**
- d. $n = 1 / \text{speed of light in the medium}$

24. In case of refraction through a glass slab=

- a. Incident ray is parallel to the refracted ray
- b. Angle of incidence is equal to the angle of refraction
- c. Incident ray is parallel to the emergent ray**
- d. Angle of refraction is equal to the angle of emergence

25. Mirror that can be chosen to view a tall building in a small mirror is

- a. Plane mirror
- b. Convex mirror**
- c. Concave mirror
- d. Plano-Convex mirror

26. Mirror formula is -

- a. $1/v - 1/u = 1/f$
- b. $1/v + 1/u = 1/f$**
- c. $M = v/u$
- d. $M = h/h$

27. The mirror used by ENT specialists is -

- a. Plane mirror
- b. Concave mirror**
- c. Convex mirror
- d. Plano-convex mirror

28. Choose wrong statement:

- (A) Light is invisible energy**
- (B) light causes us sensation of sight
- (C) Light may be obtained from heat energy
- (D) We can see light

29. Transparent medium is one:

- (A) Which partially allows light to pass through
- (B) Which absorbs most of the light
- (C) Which allows most of the light to pass through**
- (D) None of these

30. Light is: -

- (A) Transverse wave
- (B) Longitudinal wave
- (C) Mechanical wave
- (D) Both (B) and (C) are correct

31. Example of transparent medium is:

- (A) Air
- (B) Distil water
- (C) Glass
- (D) All are correct

32. Straight line path along which light travels in a given direction is :

- (A) Ray
- (B) Line segment
- (C) Beam
- (D) None of these

33. Thick layer of water is :

- (A) Transparent
- (B) Translucent
- (C) Opaque
- (D) None of these

34. In a plane mirror, which layer acts as the reflecting layer:

- (A) Glass sheet
- (B) Silver layer
- (C) Orange red paint layer
- (D) Both (A) and (B) are correct

35. Normal always lies between the incident ray and the reflected ray when the ray is incident obliquely on a surface. State true or false:

- (A) True
- (B) False
- (C) Cannot be determined
- (D) None of these.

36. A thin plane mirror:

- (A) Reflects light
- (B) Refracts light
- (C) Transmits light
- (D) None of these

37. A real image is formed when two or more:

- (A) Reflected rays meet

- (B) Refracted rays meet
- (C) Reflected rays appear to meet
- (D) Both A and B**

38. We can see the things around us due to :

- (A) Regular reflection
- (B) Irregular reflection**
- (C) Specular reflection
- (D) Mixed reflection

39. The focal length of a spherical mirror whose radius of curvature is 20 cm is :

- (A) 40 cm**
- (B) 30 cm
- (C) 20 cm
- (D) 10 cm

40. The focal length of a plane mirror is:

- (A) zero
- (B) 10 cm
- (C) 20 m
- (D) ∞**

41. Inner side of a spoon is an example of:

- (A) Concave lens
- (B) Concave mirror**
- (C) Convex mirror
- (D) Convex lens

42. A ray of light is incident on a plane mirror at an angle of incidence i . Then the ray after reflection is deviated by an angle q equal to :

- (A) i
- (B) $\pi - i$
- (C) $2i$
- (D) $\pi - 2i$**

43. Plane mirror is used in :

- (A) Galvanometer Scale
- (B) Microscope
- (C) Telescope
- (D) None of these**

44. Which of the following statement is wrong for plane mirrors?

- (A) They form virtual images
- (B) They can form enlarged images**

(C) Object size = Image size

(D) None of these

45. A ray of light coming along radius of curvature after reflection from concave mirror:

(A) passes through focus

(B) passes through centre of curvature

(C) passes through $F/2$

(D) can go in any direction

46. When image and object are on the same side of a concave mirror then nature of image will be :

(A) real

(B) virtual

(C) may be real may be virtual

(D) nothing can be said

47. The angle of incidence of a ray passing through centre of curvature of a spherical mirror is :

(A) 0°

(B) 90°

(C) 45°

(D) 180°

48. The mirror used by a dental surgeon is :

(A) Plane

(B) Convex

(C) Concave

(D) Any one of the above

49. When an object is moved from C to F of a concave mirror then its image will move from:

(A) C to F

(B) C to infinity

(C) F to C

(D) C to $2C$

50. As per New Cartesian Sign Convention:

(A) Focal length of concave mirror is positive and that of convex mirror is negative

(B) Focal length of both, convex and concave mirror is positive

(C) Focal length of both, convex and concave mirror is negative

(D) Focal length of concave mirror is negative and that of convex mirror is positive

51. The image is always erect in:

(A) Plane mirror

(B) Concave mirror

(C) Convex mirror

(D) Both (A) and (C) are correct

52. Light waves are similar in nature to :

- (A) Gamma rays
- (B) x-rays
- (C) Cathode rays
- (D) Both (A) & (B)**

53. An object of size 2.0 cm is placed perpendicular to the principal axis of a concave mirror. The distance of the object from the mirror equals the radius of curvature. The size of the image will be:

- (A) 0.5 cm
- (B) 1.0 cm
- (C) 1.5 cm
- (D) 2.0 cm**

54. An object is placed 20 cm from a convex mirror. Its image is formed 12 cm from the mirror. Find the focal length of the mirror:

- (A) 25 cm
- (B) 30 cm**
- (C) 15 cm
- (D) 60 cm

55. A dentist uses a small mirror that gives a magnification of 4 when it is held 0.60 cm from a tooth. The radius of curvature of the mirror is :

- (A) 1.60 cm (convex)
- (B) 0.8 cm (concave)
- (C) 1.60 cm (concave)**
- (D) 0.8 cm (convex)

56. When light travels from one medium to the other of which the refractive index is different, then the quantities which will change:

- (A) Frequency, wavelength and velocity
- (B) Frequency and wavelength
- (C) Frequency and velocity
- (D) Wavelength and velocity**

57. Ray nature is confirmed by the phenomenon of :

- (A) reflection
- (B) refraction
- (C) both A and B**
- (D) none of these

58. Electromagnetic wave theory was proposed by:

- (A) Maxwell**
- (B) Hertz
- (C) Huygens

(D) Newton

59. Direction of path of light changes at the interface of the two media. This as:

(A) reflection phenomenon is known

(B) absorption

(C) refraction

(D) all of these

60. Lateral shift in case of refraction through a glass slab varies inversely to:

(A) wavelength

(B) refractive index

(C) incident angle

(D) none of these

61. The velocity of light in air and glass is 3×10^8 m/s and 2×10^8 m/s respectively. What is the R.I. of glass

w.r.t. air:

(A) 1.3

(B) 1.4

(C) 1.5

(D) 6

62. The height through which an object appears to be raised in a denser medium is called:

(A) normal shift

(B) lateral shift

(C) red shift

(D) blue shift

63. R.I. of air is:

(A) 0

(B) 1

(C) 1.13

(D) 1.5

64. For regraction through a glass slab which of the following statements is correct:

(A) $\angle i_1 = \angle r_1$

(B) $\angle i_1 \neq \angle e_1$

(C) Incident and emergent rays are parallel

(D) Both A and C are correct

65. According to the principle of reversibility of light.

(A) $1\mu_2 = 2\mu_1$

(B) $1\mu_2 = 1/2\mu_1$

(C) both A & B

(D) none of these

66. Scattering is also a type of:

- (A) Regular reflection
- (B) Refraction
- (C) Diffused reflection**
- (D) Interference

67. A ray of light passing through optical centre suffers:

- (A) reflection
- (B) refraction
- (C) total internal reflection
- (D) none of these**

68. A lens is thin in the middle and thick at the edges. The lens is:

- (A) concave**
- (B) convex
- (C) plane
- (D) prism

69. A lens converges light rays. The lens is:

- (A) plane
- (B) prism
- (C) concave
- (D) convex**

70. Aperture is the diameter of:

- (A) Entire lens
- (B) Only that part of lens through which refraction is taking place**
- (C) Case of lens
- (D) None of these

71. Which of the following terms is not related to spherical mirrors:

- (A) Principal axis**
- (B) Optical centre
- (C) Aperture
- (D) None of these

72. The sign of power of convex lens is:

- (A) positive**
- (B) negative
- (C) zero
- (D) infinite

73. If the magnification of a lens has negative value, the image is:

- (A) virtual and erect

(B) real and inverted

(C) A or B any

(D) neither A nor B

74. A lens of power 6 D is put in contact with a lens of power -4 D. The combination will behave like a:

(A) divergent lens of focal length 25 cm

(B) convergent lens of focal length 50 cm

(C) divergent lens of focal length 20 cm

(D) convergent lens of focal length 100 cm

75. If an object of size 5 cm is placed 20 cm from a lens and its image of same size is formed 20 cm from lens on other side, lens is:

(A) convex

(B) concave

(C) glass slab

(D) prism

76. A virtual image is smaller than the object can be formed by:

(A) convex lens

(B) concave lens

(C) concave mirror

(D) plane mirror

77. We put glass piece on a printed page, image of prints on the page has same size when viewed from glass piece. The piece is:

(A) convex lens

(B) glass slab

(C) concave lens

(D) prism

78. In above question if the print image is enlarged then the piece is a :

(A) glass slab

(B) convex lens

(C) concave lens

(D) prism

79. If parallel rays are incident on a convex lens, after refraction these rays will meet at :

(A) focus

(B) centre of curvature

(C) focal plane

(D) none of these

80. If image formed by a lens is always diminished and between F and O then the lens is :

(A) concave

(B) convex

(C) both A and B

(D) none of these

81. If optical density of a medium is high then the speed of light in that medium is :

(A) high

(B) low

(C) unchanged

(D) none of these

82. A light is said to be convergent when:

(A) All the rays spread around from a point source of light

(B) It travels in an irregular pattern

(C) All the rays travel parallel to each other

(D) all the rays meet together to a single point

83. When the ray of light falls obliquely on the interface of two media and goes to the another medium. It is called:

(A) Reflection of light

(B) Refraction of light

(C) Dispersion of light

(D) Both (A) and (B)

84. Convex lens is used in case of:

(A) myopia

(B) hypermetropia

(C) presbyopia

(D) astigmatism

85. Short sightedness is also called as:

(A) myopia

(B) hypermetropia

(C) presbyopia

(D) astigmatism

86. Cylindrical lens is used in case of:

(A) myopia

(B) hypermetropia

(C) presbyopia

(D) astigmatism

87. Even in absolutely clear water, a diver cannot see very clearly:

(A) Because rays of light get diffused

(B) Because velocity of light is reduced in water

(C) Because a ray of light passing through the water makes it turbid

(D) Because the focal length of the eye lens in water gets changed and the image is no longer focused sharply on the retina

88. The persistence of vision of the eye is:

- (A) 1 /16 second
- (B) 1/5 second
- (C) 1/26 second
- (D) 1/100 second

89. In eye, the focusing is done by:

- (A) to and fro movement of the eye lens
- (B) to and fro movement of retina
- (C) change in the convexity of the lens
- (D) change in refractive index of the eye fluid

90. While looking at nearby objects, the muscle _____ so as to _____ the focal length of eye lens.

- (A) Contracts, increase
- (B) Relax, increase
- (C) Contracts, decrease
- (D) Relax, decrease

91. Which of the following factors is responsible for the refraction:

- (A) Optical density
- (B) Frequency of light
- (C) Angle of incidence
- (D) Mass density

92. An object is placed at a distance $2f$ from the pole of a convex mirror of focal length f . The linear magnification is:

- a. $1/3$ b. $2/3$ c. $3/4$ d. 1

93. In case of an demished and erect image, the magnification of a mirror is:

- A. Positive B. Unity C. Infinity D. Negative

94. If an incident ray passes through the focus, the reflected ray will

- (a) pass through the pole
- (b) be parallel to the principal axis
- (c) retrace its path
- (d) pass through the centre of curvature

95. 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

96. An object at a distance of + 15 cm is slowly moved towards the pole of a convex mirror. The image will get

- (a) shortened and real
- (b) enlarged and real

(c) enlarge and virtual

(d) diminished and virtual

97. The refractive index of a medium with respect to vacuum is

(a) Always greater than one

(b) Always less than one

(c) Equal to one

(d) none of the above

98. Magnification produced by a plane mirror is

(a) -1

(b) zero

(c) +1

(d) infinity

99. The persistence of image for normal human eye is

a. (1/16) of a second

b. (1/10) of a second

c. (1/6) of a second

d. (1/18) of a second

100. Under which of the following conditions a concave mirror can form an image larger than the actual object?

(a) When object is kept at a distance greater than 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 the object is kept at a distance equal to its radius of curvature

101. Choose the Statement Which Is/ Are Incorrect?

(a) Greater the difference in the speed of light in the two media, greater will be the amount of refraction or bending of light refraction of light take place at the boundary between the two media.

(b) The bending of light when it goes from one medium to another obliquely is called refraction of light.

(c) The speed of light in air is 3×10^8 m/s whereas that in glass is 2×10^8 m/s.

(d) None of these

102. 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.

103. 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 mirrors

(d) both concave as well as plane mirror

104. A point source of light is placed at the centre of curvature of a concave mirror. The angle of deviation of the rays incident on the mirror from this source and reflected from it is.....180 degree.....

104. 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

105. 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

106. Between red and violet, which color has high frequency?

- (a) Red has high frequency than violet
- (b) Violet has high frequency than red**
- (c) Red and violet has the same frequency
- (d) Cannot say

107. 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

108. The refractive index of a medium with respect to vacuum is -

- (a) Always greater than one**
- (b) Always less than one
- (c) Equal to one
- (d) none of the above

109. In case of refraction, if the angle of incidence and the angle of refraction are 45 degrees and 30 degrees respectively, then the angle of deviation is -

- (a) 75
- (b) 15**
- (c) 7.5
- (d) 37.5

110. 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) 10 cm**
- (d) 60 cm

110. 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**