Chapter 3:Geometrical Optics

MCQs;

1. What is the speed of light in vacuum?
a) 3 × 10^8 m/s
b) 3 × 10^10 m/s
c) 3 × 10^6 m/s
d) 2 × 10^8 m/s

Answer: a)

2. Which of the following is the primary medium for the propagation of light?
a) Air
b) Water
c) Vacuum
d) Glass

Answer: c)

3. The reflection of light occurs at the interface of:
a) Two transparent media
b) A transparent and an opaque medium
c) Two opaque media
d) A surface

Answer: d)

4. The angle of incidence is:
a) The angle between the incident ray and the normal
b) The angle between the reflected ray and the normal
c) The angle between the incident ray and the reflected ray
d) The angle between the reflected ray and the surface

Answer: a)

5. Which of the following laws governs reflection?
a) Snell's Law
b) Laws of Reflection
c) Huygens' Principle

d) Ohm’s Law

Answer: b)

6. What is the focal length of a concave mirror?
a) Positive
b) Negative
c) Zero
d) Undefined

Answer: a)

7. Which of the following describes a convex mirror?
a) It converges light rays
b) It diverges light rays
c) It focuses light at a point
d) It magnifies objects

Answer: b)

8. What happens when light passes from a denser medium to a rarer medium?
a) The light bends away from the normal
b) The light bends towards the normal
c) The light does not bend
d) The light reflects back

Answer: a)

9. The focal length of a convex lens is:
a) Positive
b) Negative
c) Zero
d) Undefined

Answer: a)

10. A real image is formed by a:
a) Convex mirror
b) Concave lens

c) Convex lens
d) Concave mirror

Answer: d)

11. The image formed by a concave lens is always:
a) Real and inverted
b) Virtual and upright
c) Virtual and inverted
d) Real and upright

Answer: b)

12. The image formed by a convex lens when the object is beyond 2F is:
a) Real, inverted, and diminished
b) Virtual, upright, and diminished
c) Real, inverted, and magnified
d) Virtual, upright, and magnified

Answer: a)

13. A ray parallel to the principal axis after passing through a convex lens:
a) Passes through the focal point
b) Diverges from the focal point
c) Continues straight
d) Becomes parallel to the axis

Answer: a)

14. A diverging lens is another name for:
a) Convex lens
b) Concave mirror
c) Concave lens
d) Plane mirror

Answer: c)

15. The focal length of a lens is:
a) The distance between the lens and the object

b) The distance between the lens and the image
c) The distance between the lens and the focal point
d) The distance from the object to the image

Answer: c)

16. The critical angle is:
a) The angle at which total internal reflection occurs
b) The angle at which the light exits the medium
c) The angle of incidence for refraction
d) The angle at which refraction does not occur

Answer: a)

17. In total internal reflection, the angle of incidence is greater than the:
a) Angle of refraction
b) Critical angle
c) Angle of reflection
d) Refractive index

Answer: b)

18. The magnification of a mirror is given by:
a) Image height / Object height
b) Object height / Image height
c) Distance of object / Distance of image
d) Distance of image / Distance of object

Answer: a)

19. In a convex mirror, the image formed is:
a) Real and diminished
b) Virtual and diminished
c) Real and magnified
d) Virtual and magnified

Answer: b)

20. The refraction of light occurs when:

a) Light bounces back from a surface
b) Light passes from one medium to another
c) Light passes through a prism
d) Light focuses at a point

Answer: b)

21. The refractive index of a medium is the ratio of:
a) Speed of light in vacuum to the speed of light in the medium
b) Speed of light in the medium to the speed of light in air
c) Angle of incidence to the angle of refraction
d) Angle of refraction to the angle of incidence

Answer: a)

22. The image formed by a plane mirror is:
a) Real and upright
b) Virtual and inverted
c) Virtual and upright
d) Real and inverted

Answer: c)

23. In refraction, the light ray bends towards the normal when it passes into:
a) A denser medium
b) A rarer medium
c) A medium of equal density
d) None of the above

Answer: a)

24. A concave lens is used in:
a) Glasses for nearsightedness
b) Glasses for farsightedness
c) Magnifying glasses
d) Rear-view mirrors

Answer: a)

25. The power of a lens is the inverse of its focal length in meters. What is the unit of power?
a) Meter
b) Meter^-1
c) Diopter
d) Watt

Answer: c)

26. The principal focus of a concave mirror is:
a) Behind the mirror
b) In front of the mirror
c) At the center of curvature
d) At the focal point

Answer: b)

27. The total internal reflection can only occur when the angle of incidence is:
a) Less than the critical angle
b) Equal to the critical angle
c) Greater than the critical angle
d) Zero

Answer: c)

28. A concave lens produces:
a) Real and diminished image
b) Real and magnified image
c) Virtual and diminished image
d) Virtual and magnified image

Answer: c)

29. The lens formula is:
a) 1/f = 1/v + 1/u
b) 1/f = v + u
c) f = v + u
d) 1/f = v - u

Answer: a)

30. The image formed by a convex lens when the object is between F and 2F is:
a) Real, inverted, and magnified
b) Virtual, upright, and magnified
c) Real, upright, and diminished
d) Virtual, inverted, and diminished

Answer: a)

31. The image formed by a concave lens is always:
a) Real and inverted
b) Virtual and upright
c) Real and upright
d) Virtual and inverted

Answer: b)

32. A concave mirror can form:
a) Only virtual images
b) Only real images
c) Both real and virtual images
d) No images

Answer: c)

33. The refractive index of water is approximately:
a) 1
b) 1.33
c) 1.5
d) 2

Answer: b)

34. The image formed by a concave mirror is real when the object is:
a) Beyond the focal point
b) At the focal point
c) Between the mirror and the focal point
d) At infinity

Answer: a)

35. The focal length of a lens is defined as:
a) The distance from the lens to the object
b) The distance from the lens to the image
c) The distance from the center of the lens to the principal focus
d) The distance from the lens to the optical center

Answer: c)

36. If the focal length of a lens is 20 cm, what is its power?
a) 2 D
b) 5 D
c) 0.5 D
d) 1 D

Answer: b)

37. What is the effect of increasing the curvature of a lens?
a) It increases the focal length
b) It decreases the focal length
c) It has no effect on the focal length
d) It increases the magnification

Answer: b)

38. A ray of light passes through the center of curvature of a concave mirror. What happens to the ray?
a) It gets reflected along its path
b) It passes through the focal point
c) It reflects at an angle of 90°
d) It gets absorbed by the mirror

Answer: a)

39. Which of the following is true for all images formed by a concave lens?
a) Real and inverted
b) Virtual and upright
c) Real and upright
d) Virtual and inverted

Answer: b)

40. The power of a concave lens is:
a) Positive
b) Negative
c) Zero
d) Undefined

Answer: b)