Physical Science: Light & Sound

100 Multiple Choice Questions for Government Job Examinations

1. According to the laws of reflection, the angle of incidence is always equal to the:

(A) critical angle
(B) angle of deviation
(C) angle of refraction
(D) angle of reflection

2. In reflection, the angle of incidence is measured between the incident ray and the:

(A) mirror surface
(B) reflected ray
(C) normal
(D) principal axis

3. A ray of light makes an angle of 30° with the surface of a plane mirror. The angle of reflection is:

(A) 120°
(B) 90°
(C) 60°
(D) 30°

4. A person stands 3 m in front of a plane mirror. The distance between the person and the image is:

(A) 9 m
(B) 1.5 m
(C) 6 m
(D) 3 m

5. The minimum height of a plane mirror needed to see the full image of a person is:

(A) equal to the person's height
(B) one-third of the person's height
(C) twice the person's height
(D) half of the person's height

6. The word AMBULANCE is written laterally inverted on the front of the vehicle so that it can be read correctly in the:

(A) rear-view mirror of the vehicle ahead
(B) headlight of the vehicle
(C) number plate
(D) side window

7. Two plane mirrors inclined at 60° to each other form how many images of an object placed between them?

(A) 7
(B) 5
(C) 6
(D) 4

8. Reflection of light from a rough surface is called:

(A) total internal reflection
(B) regular reflection
(C) refraction
(D) diffuse reflection

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9. The centre of the reflecting surface of a spherical mirror is called its:

(A) centre of curvature
(B) aperture
(C) pole
(D) principal focus

10. For a spherical mirror of small aperture, the focal length f and radius of curvature R are related as:

(A) f = R/2
(B) f = R/4
(C) f = R
(D) f = 2R

11. The focal length of a convex mirror is taken as:

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

12. The image of an object placed between the pole and the focus of a concave mirror is:

(A) real, inverted and enlarged
(B) virtual, erect and enlarged
(C) real, inverted and diminished
(D) virtual, erect and diminished

13. A concave mirror forms a real, inverted image of the same size when the object is placed:

(A) between the focus and the pole
(B) at the focus
(C) at infinity
(D) at the centre of curvature

14. When an object is at infinity in front of a concave mirror, the image is formed at:

(A) behind the mirror
(B) the pole
(C) the principal focus
(D) the centre of curvature

15. A concave mirror has a focal length of 20 cm. Its radius of curvature is:

(A) 10 cm
(B) 20 cm
(C) 40 cm
(D) 80 cm

16. The magnification produced by a spherical mirror is given by:

(A) m = v/u
(B) m = –v/u
(C) m = u/v
(D) m = u – v

17. Which mirror is used by a dentist to see an enlarged image of the teeth?

(A) Concave mirror
(B) Plane mirror
(C) Cylindrical mirror
(D) Convex mirror

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18. Convex mirrors are used in shops and at road bends because they:

(A) form real images
(B) give a wider field of view
(C) form inverted images
(D) magnify the objects

19. According to the Cartesian sign convention, the object distance for a mirror is always:

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

20. The image formed by a convex mirror, wherever the object is placed, is:

(A) virtual, erect and diminished
(B) real, erect and enlarged
(C) real, inverted and diminished
(D) virtual, erect and enlarged

21. The bending of light when it passes from one transparent medium to another is called:

(A) refraction
(B) dispersion
(C) reflection
(D) scattering

22. Refraction of light takes place because:

(A) light is a particle
(B) the speed of light is different in different media
(C) the frequency of light changes at the boundary
(D) light is absorbed by the second medium

23. Snell's law is expressed as:

(A) $\sin i + \sin r = \text{constant}$
(B) $n_1 \cos i = n_2 \cos r$
(C) $n_1 \sin i = n_2 \sin r$
(D) $n_1 \sin r = n_2 \cos i$

24. The absolute refractive index of a medium is the ratio of the speed of light:

(A) in the medium to its speed in vacuum
(B) in water to its speed in air
(C) in air to its speed in the medium
(D) in vacuum to its speed in the medium

25. The refractive index of water is 1.33. The speed of light in water is approximately:

(A) 1.33×10^8 m/s
(B) 3×10^8 m/s
(C) 4×10^8 m/s
(D) 2.25×10^8 m/s

26. Which of the following media is optically denser than glass (n = 1.5)?

(A) Ice
(B) Water
(C) Air
(D) Diamond

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27. A coin lying at the bottom of a vessel of water appears:

(A) exactly at its real position
(B) raised
(C) lowered
(D) displaced sideways

28. A ray of light passing through a rectangular glass slab emerges:

(A) perpendicular to the incident ray
(B) totally reflected back
(C) along the same line as the incident ray
(D) parallel to the incident ray but laterally shifted

29. The critical angle c of a medium of refractive index n is given by:

(A) sin c = 1/n
(B) tan c = n
(C) sin c = n
(D) cos c = 1/n

30. Which of the following has the smallest critical angle?

(A) Water
(B) Ice
(C) Crown glass
(D) Diamond

31. The formation of a mirage in deserts is due to:

(A) diffraction of light
(B) reflection from a plane mirror
(C) total internal reflection
(D) polarisation of light

32. Optical fibres work on the principle of:

(A) scattering
(B) diffraction
(C) total internal reflection
(D) dispersion

33. Which colour of white light is deviated the most by a glass prism?

(A) Green
(B) Violet
(C) Yellow
(D) Red

34. Which colour has the longest wavelength in the visible spectrum?

(A) Blue
(B) Violet
(C) Red
(D) Green

35. The splitting of white light into its component colours is called:

(A) dispersion
(B) reflection
(C) scattering
(D) diffraction

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36. In the primary rainbow, the colour on the outer edge is:

(A) green
(B) violet
(C) blue
(D) red

37. The Sun is visible a little before the actual sunrise because of:

(A) atmospheric refraction
(B) dispersion of light
(C) total internal reflection
(D) scattering of light

38. The Sun appears red at sunrise and sunset because:

(A) the atmosphere reflects red light upwards
(B) the temperature of the Sun changes
(C) red light is scattered the most
(D) red light is scattered the least and reaches us after a long path

39. The Tyndall effect is caused by:

(A) refraction of light by a lens
(B) scattering of light by colloidal particles
(C) reflection of light from a mirror
(D) absorption of light by water

40. Which lens is thicker at the centre than at the edges?

(A) Plano-concave lens
(B) Concave lens
(C) Plane glass slab
(D) Convex lens

41. A convex lens is also known as a:

(A) reflecting lens
(B) converging lens
(C) diverging lens
(D) dispersing lens

42. A ray of light passing through the optical centre of a lens:

(A) bends towards the principal axis
(B) bends away from the principal axis
(C) is reflected back
(D) passes without any deviation

43. The lens formula is:

(A) $1/v + 1/u = 1/f$
(B) $f = u \times v$
(C) $1/f = u + v$
(D) $1/v - 1/u = 1/f$

44. The SI unit of power of a lens is:

(A) hertz
(B) dioptre
(C) metre
(D) watt

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45. The power of a concave lens of focal length 25 cm is:

(A) –4 D
(B) +4 D
(C) –0.25 D
(D) +0.25 D

46. A lens of power +2.5 D has a focal length of:

(A) 4 cm
(B) 40 cm
(C) 2.5 cm
(D) 25 cm

47. The magnification produced by a lens is given by:

(A) m = v/u
(B) m = u/v
(C) m = –v/u
(D) m = u × v

48. When an object is placed at the principal focus of a convex lens, the image is formed at:

(A) F on the other side
(B) 2F on the other side
(C) infinity
(D) the optical centre

49. A convex lens forms a virtual, erect and enlarged image when the object is placed:

(A) at F
(B) at 2F
(C) beyond 2F
(D) between F and the optical centre

50. An object is placed 20 cm in front of a convex lens of focal length 10 cm. The image distance is:

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

51. Two thin lenses of powers +3 D and +2 D are placed in contact. The focal length of the combination is:

(A) 10 cm
(B) 5 cm
(C) 20 cm
(D) 50 cm

52. The pupil of the human eye is:

(A) the light-sensitive layer of the eye
(B) the transparent front part of the eye
(C) the opening in the iris through which light enters
(D) the fluid behind the eye lens

53. Most of the refraction of light entering the human eye takes place at the:

(A) cornea
(B) iris
(C) retina
(D) eye lens

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54. The light-sensitive layer of the human eye is the:

(A) retina
(B) iris
(C) choroid
(D) cornea

55. Hypermetropia (far-sightedness) is corrected by using a:

(A) cylindrical lens
(B) convex lens
(C) plane glass
(D) concave lens

56. In myopia the image of a distant object is formed:

(A) exactly on the retina
(B) on the blind spot
(C) behind the retina
(D) in front of the retina

57. Presbyopia is corrected by using:

(A) cylindrical lenses
(B) bifocal lenses
(C) only concave lenses
(D) plane glasses

58. Astigmatism is corrected by using a:

(A) cylindrical lens
(B) convex lens
(C) concave lens
(D) bifocal lens

59. The far point of a normal human eye is at:

(A) 1 m
(B) infinity
(C) 2.5 cm
(D) 25 cm

60. The blind spot is the point where:

(A) the eye lens is attached
(B) the optic nerve leaves the eye
(C) the image is sharpest
(D) the pupil is located

61. The region of the retina with the sharpest vision is the:

(A) cornea
(B) choroid
(C) fovea (yellow spot)
(D) blind spot

62. Colour blindness is more common in:

(A) males
(B) old people only
(C) females
(D) children only

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63. Which part of the human eye can be transplanted from a donor?

(A) Retina
(B) Iris
(C) Optic nerve
(D) Cornea

64. Sound is produced by:

(A) vibrating bodies
(B) heated bodies only
(C) electromagnetic waves only
(D) bodies at rest

65. In a longitudinal wave, the particles of the medium vibrate:

(A) parallel to the direction of the wave
(B) in circles
(C) perpendicular to the direction of the wave
(D) not at all

66. The region of high pressure in a sound wave is called a:

(A) crest
(B) compression
(C) trough
(D) rarefaction

67. The speed of sound in air increases with:

(A) a decrease in humidity
(B) a decrease in temperature
(C) an increase in frequency
(D) an increase in temperature

68. In which of the following does sound travel the slowest?

(A) Steel
(B) Air
(C) Water
(D) Iron

69. We hear thunder after seeing lightning because:

(A) sound is absorbed by clouds
(B) light is louder than sound
(C) thunder is produced later
(D) the speed of sound is much less than the speed of light

70. The loudness of a sound depends mainly on its:

(A) amplitude
(B) speed
(C) frequency
(D) wavelength

71. The quality (timbre) of a sound helps us to:

(A) distinguish two sounds of the same pitch and loudness
(B) find its frequency
(C) find its speed
(D) measure its loudness

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72. Sound of frequency above 20,000 Hz is called:

(A) infrasound
(B) audible sound
(C) ultrasound
(D) seismic sound

73. Which of the following produces infrasonic sound?

(A) Elephant
(B) Dog whistle
(C) Dolphin
(D) Bat

74. The Doppler effect is the apparent change in:

(A) speed of light
(B) wavelength of light only
(C) amplitude of the source
(D) frequency due to relative motion between source and listener

75. A sonic boom is produced by:

(A) an infrasonic source
(B) a stationary source
(C) an object moving slower than sound
(D) an object moving faster than sound

76. The smallest bone in the human body, found in the ear, is the:

(A) stirrup
(B) hammer
(C) pinna
(D) anvil

77. The distance between two consecutive compressions of a sound wave is called its:

(A) wavelength
(B) frequency
(C) amplitude
(D) time period

78. The frequency of a wave having a time period of 0.01 s is:

(A) 10 Hz
(B) 100 Hz
(C) 1 Hz
(D) 0.01 Hz

79. The relation between wave speed v, frequency f and wavelength λ is:

(A) $v = \lambda/f$
(B) $v = f\lambda$
(C) $v = f + \lambda$
(D) $v = f/\lambda$

80. Sound of frequency 170 Hz travels in air at 340 m/s. Its wavelength is:

(A) 1 m
(B) 2 m
(C) 4 m
(D) 0.5 m

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81. When sound passes from air into water, its wavelength:

(A) becomes zero
(B) remains the same
(C) decreases
(D) increases

82. If the frequency of a wave is doubled in the same medium, its wavelength becomes:

(A) double
(B) four times
(C) half
(D) unchanged

83. The maximum displacement of a particle from its mean position is called:

(A) time period
(B) wavelength
(C) amplitude
(D) frequency

84. One kilohertz is equal to:

(A) 100 Hz
(B) 10,000 Hz
(C) 1000 Hz
(D) 1,000,000 Hz

85. An echo is based on the:

(A) absorption of sound
(B) reflection of sound
(C) refraction of sound
(D) diffraction of sound

86. The minimum distance of a reflecting surface for a distinct echo, taking the speed of sound as 340 m/s and persistence of hearing as 0.1 s, is:

(A) 8.5 m
(B) 34 m
(C) 17 m
(D) 68 m

87. A man hears the echo of his shout after 3 s. If the speed of sound is 330 m/s, the distance of the reflecting surface is:

(A) 247.5 m
(B) 330 m
(C) 495 m
(D) 990 m

88. Reverberation in a hall can be reduced by using:

(A) sound-absorbing materials such as curtains and carpets
(B) polished marble floors
(C) bare concrete walls
(D) large glass walls

89. Curved ceilings and sound boards are used in concert halls to:

(A) reflect sound evenly to all parts of the audience
(B) reduce the loudness
(C) absorb all the sound
(D) create a loud echo

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90. A stethoscope works on the principle of:

(A) dispersion of sound
(B) refraction of sound
(C) diffraction of sound
(D) multiple reflection of sound

91. The famous whispering gallery, Gol Gumbaz, is located in:

(A) Jaipur
(B) Kolkata
(C) Bijapur (Karnataka)
(D) Agra

92. The rolling of thunder is caused by:

(A) dispersion of sound
(B) repeated reflection of sound from clouds and hills
(C) refraction of light in clouds
(D) diffraction of light

93. SONAR makes use of:

(A) ultrasonic waves
(B) infrared waves
(C) radio waves
(D) X-rays

94. RADAR makes use of:

(A) infrasonic waves
(B) radio waves
(C) visible light only
(D) ultrasonic waves

95. The technique of breaking kidney stones into fine grains with focused ultrasonic waves is called:

(A) endoscopy
(B) echocardiography
(C) angiography
(D) lithotripsy

96. Echocardiography uses ultrasound to make images of the:

(A) teeth
(B) lungs
(C) bones
(D) heart

97. Ultrasonic flaw detection is used to:

(A) increase the hardness of metals
(B) find hidden cracks and holes in metal blocks
(C) measure the temperature of metals
(D) change the colour of metals

98. A ship's SONAR receives an echo from the sea bed after 2 s. If the speed of sound in water is 1500 m/s, the depth of the sea is:

(A) 500 m
(B) 1500 m
(C) 3000 m
(D) 750 m

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99. Which of the following uses echolocation to find its way in the dark?

(A) Camel
(B) Cow
(C) Bat
(D) Horse

100. Ultrasonography is considered safe because:

(A) it uses gamma rays
(B) it uses X-rays of low intensity
(C) it uses infrared heating
(D) it does not use ionising radiation

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Answer Key

Q.	Ans	Q.	Ans	Q.	Ans	Q.	Ans	Q.	Ans
1	D	21	A	41	B	61	C	81	D
2	C	22	B	42	D	62	A	82	C
3	C	23	C	43	D	63	D	83	C
4	C	24	D	44	B	64	A	84	C
5	D	25	D	45	A	65	A	85	B
6	A	26	D	46	B	66	B	86	C
7	B	27	B	47	A	67	D	87	C
8	D	28	D	48	C	68	B	88	A
9	C	29	A	49	D	69	D	89	A
10	A	30	D	50	A	70	A	90	D
11	C	31	C	51	C	71	A	91	C
12	B	32	C	52	C	72	C	92	B
13	D	33	B	53	A	73	A	93	A
14	C	34	C	54	A	74	D	94	B
15	C	35	A	55	B	75	D	95	D
16	B	36	D	56	D	76	A	96	D
17	A	37	A	57	B	77	A	97	B
18	B	38	D	58	A	78	B	98	B
19	C	39	B	59	B	79	B	99	C
20	A	40	D	60	B	80	B	100	D

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Physical Science: Light & Sound

100 Multiple Choice Questions for Government Job Examinations (Set 2)

1. A ray of light incident normally on a plane mirror is reflected:

(A) at 45° to the normal
(B) not at all, it is absorbed
(C) at 90° to the normal
(D) back along the same path

2. If the angle between the incident ray and the reflected ray is 90°, the angle of incidence is:

(A) 90°
(B) 30°
(C) 45°
(D) 60°

3. An object moves towards a plane mirror at 2 m/s. The speed of the image relative to the object is:

(A) 8 m/s
(B) 1 m/s
(C) 4 m/s
(D) 2 m/s

4. An object is 50 cm in front of a plane mirror. If the mirror is moved 10 cm closer to the object, the distance between the object and its image becomes:

(A) 90 cm
(B) 60 cm
(C) 80 cm
(D) 100 cm

5. Which of the following images cannot be obtained on a screen?

(A) A real image
(B) The image formed by a camera lens
(C) The image formed on the retina
(D) A virtual image

6. A periscope works on the principle of:

(A) reflection of light from plane mirrors
(B) refraction of light
(C) dispersion of light
(D) diffraction of light

7. In a torch, the bulb is placed at the ____ of the concave reflector to get a parallel beam.

(A) a point behind the pole
(B) principal focus
(C) centre of curvature
(D) pole

8. The radius of curvature of a convex mirror is 40 cm. Its focal length is:

(A) +40 cm
(B) −20 cm
(C) −40 cm
(D) +20 cm

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9. An object 5 cm high placed before a concave mirror forms a real image 10 cm high. The magnification is:

(A) +2
(B) +0.5
(C) −2
(D) −0.5

10. A concave mirror of focal length 10 cm forms the image of an object placed at 20 cm from it. The image is formed:

(A) at 20 cm in front of the mirror
(B) at infinity
(C) at 10 cm in front of the mirror
(D) at 20 cm behind the mirror

11. The minimum height of a plane mirror needed to see the full image of a person 1.8 m tall is:

(A) 3.6 m
(B) 0.6 m
(C) 0.9 m
(D) 1.8 m

12. Solar furnaces use:

(A) convex mirrors
(B) large concave mirrors
(C) plane mirrors only
(D) cylindrical mirrors

13. Lateral inversion means that:

(A) the image is magnified
(B) the image is upside down
(C) the image forms behind the object
(D) the left side of the object appears as the right side in the image

14. Which statement is true for a convex mirror?

(A) It is used as a dentist's mirror
(B) Its focal length is negative
(C) It always forms a virtual image
(D) It can form a real, enlarged image

15. A ray passing through the centre of curvature of a concave mirror is reflected:

(A) parallel to the principal axis
(B) through the principal focus
(C) back along the same path
(D) through the pole

16. The distance of the principal focus from the pole of a spherical mirror is called its:

(A) radius of curvature
(B) focal length
(C) aperture
(D) magnification

17. A ray of light passes from water (n = 1.33) into glass (n = 1.5). The ray will:

(A) bend towards the normal
(B) go straight without bending
(C) undergo total internal reflection
(D) bend away from the normal

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18. Which of the following has the lowest refractive index?

(A) Glass
(B) Air
(C) Diamond
(D) Water

19. The refractive index of diamond is 2.4. The speed of light in diamond is approximately:

(A) 7.2×10^8 m/s
(B) 2.4×10^8 m/s
(C) 1.25×10^8 m/s
(D) 3×10^8 m/s

20. A ray going from glass to air with an angle of incidence greater than the critical angle undergoes:

(A) total internal reflection
(B) dispersion
(C) refraction away from the normal
(D) refraction towards the normal

21. The critical angle for light going from water to air is approximately:

(A) 48.6°
(B) 90°
(C) 24.4°
(D) 30°

22. A pond has a real depth of 4 m. If the refractive index of water is 4/3, the apparent depth is:

(A) 2 m
(B) 3 m
(C) 4 m
(D) 5.33 m

23. A glass prism splits white light into colours because:

(A) the frequency of light changes inside glass
(B) white light is an impure light
(C) different colours travel with different speeds in glass
(D) glass absorbs some colours

24. A rainbow is seen when the Sun is:

(A) in front of the observer
(B) directly overhead only
(C) below the horizon
(D) behind the observer

25. Among the colours of white light, which travels with the lowest speed in glass?

(A) Yellow
(B) Red
(C) Green
(D) Violet

26. In vacuum, all colours of light travel with:

(A) violet light as the fastest
(B) different speeds
(C) red light as the fastest
(D) the same speed

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27. Planets do not twinkle like stars because they:

(A) do not reflect light
(B) are nearer and act as extended sources of light
(C) are brighter than stars
(D) are hotter than stars

28. Danger signal lamps are red in colour because red light:

(A) is absorbed by fog
(B) has the highest speed in air
(C) is scattered the most
(D) is scattered the least

29. The sky appears dark to an astronaut in space because:

(A) there is no atmosphere to scatter sunlight
(B) the Sun does not emit light in space
(C) there is too much dust in space
(D) sunlight is absorbed by the Moon

30. Clouds appear white because:

(A) they absorb all colours
(B) they scatter only blue light
(C) they reflect only red light
(D) large water droplets scatter all colours almost equally

31. The refractive index of a medium depends on:

(A) the angle of incidence
(B) the thickness of the medium
(C) the nature of the medium and the colour of light
(D) the intensity of light

32. A diamond sparkles mainly because of:

(A) polarisation
(B) absorption of light
(C) total internal reflection
(D) diffraction

33. For light passing from air into a medium, the ratio sin i / sin r gives the medium's:

(A) dispersive power
(B) refractive index
(C) power
(D) critical angle

34. Kerosene floats on water even though it is optically denser than water because:

(A) it dissolves in water
(B) its refractive index is lower than that of water
(C) its mass density is lower than that of water
(D) its refractive index equals that of air

35. The focal length of a lens depends on:

(A) the curvature of its surfaces and the material of the lens
(B) the colour of the object
(C) the distance of the object only
(D) the position of the screen only

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36. A lens of focal length 0.5 m has a power of:

(A) +5 D
(B) +0.5 D
(C) −2 D
(D) +2 D

37. A parallel beam of light after passing through a concave lens:

(A) diverges
(B) is reflected back
(C) remains parallel
(D) converges to a focus

38. A ray parallel to the principal axis of a convex lens passes, after refraction, through:

(A) the centre of the lens surface only
(B) the first principal focus
(C) the optical centre
(D) the second principal focus

39. A convex lens of focal length 15 cm forms a real image of the same size as the object. The object distance is:

(A) 7.5 cm
(B) 30 cm
(C) 15 cm
(D) 45 cm

40. A lens has a power of −5 D. Its focal length is:

(A) −5 cm
(B) +20 cm
(C) −50 cm
(D) −20 cm

41. The image formed by the objective lens of a compound microscope is:

(A) virtual and diminished
(B) real, inverted and enlarged
(C) virtual and erect
(D) real, erect and diminished

42. The lens used in a simple microscope is:

(A) a concave lens of long focal length
(B) a cylindrical lens
(C) a plane glass slab
(D) a convex lens of short focal length

43. Which lens is used in the peephole of a door?

(A) Convex lens
(B) Plane glass
(C) Cylindrical lens
(D) Concave lens

44. The ability of a lens to converge or diverge light rays is called its:

(A) magnification
(B) power
(C) dispersion
(D) aperture

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45. The image formed by a concave lens is always:

(A) smaller than the object
(B) larger than the object
(C) real
(D) inverted

46. In a slide projector, the slide is placed:

(A) between F and the optical centre
(B) between F and 2F of the convex lens
(C) beyond 2F
(D) at the optical centre

47. In a camera, an object beyond 2F forms an image on the film that is:

(A) real, inverted and diminished
(B) virtual and inverted
(C) virtual, erect and enlarged
(D) real, erect and enlarged

48. The change in the focal length of the eye lens is brought about by the:

(A) optic nerve
(B) iris
(C) ciliary muscles
(D) cornea

49. A normal human eye can see objects clearly from 25 cm to:

(A) 10 m
(B) 100 m
(C) 1 km
(D) infinity

50. A person cannot see distant objects clearly but can see nearby objects. The defect is:

(A) myopia
(B) presbyopia
(C) astigmatism
(D) hypermetropia

51. A person cannot see nearby objects clearly and has a near point of 1 m. The defect is:

(A) colour blindness
(B) cataract
(C) hypermetropia
(D) myopia

52. Which cells of the retina work in dim light?

(A) Cones
(B) Iris cells
(C) Rods
(D) Cells of the fovea

53. The visual pigment rhodopsin is made with the help of:

(A) Vitamin A
(B) Vitamin D
(C) Vitamin K
(D) Vitamin C

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54. Cataract is the clouding of the:

(A) eye lens
(B) retina
(C) iris
(D) cornea

55. Increased fluid pressure inside the eyeball that damages the optic nerve is called:

(A) trachoma
(B) glaucoma
(C) conjunctivitis
(D) cataract

56. In bright light, the pupil of the eye:

(A) closes completely
(B) remains unchanged
(C) dilates
(D) contracts

57. The colour of the human eye is decided by the:

(A) cornea
(B) iris
(C) sclera
(D) retina

58. The dark layer between the sclera and the retina is the:

(A) choroid
(B) cornea
(C) iris
(D) vitreous humour

59. Persistence of vision is made use of in:

(A) periscopes
(B) cinema and television
(C) plane mirrors
(D) microscopes

60. The diameter of the human eyeball is approximately:

(A) 23 cm
(B) 2.3 cm
(C) 0.23 cm
(D) 230 cm

61. The distance between the eye lens and the retina is approximately:

(A) 0.25 cm
(B) 250 cm
(C) 2.5 cm
(D) 25 cm

62. Sound travels in the form of:

(A) mechanical waves
(B) cosmic rays
(C) electromagnetic waves
(D) light rays

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63. Astronauts on the Moon talk to each other using radio because:

(A) the Moon is very cold
(B) the Moon is very noisy
(C) light travels faster than sound
(D) there is no air on the Moon for sound to travel

64. The speed of sound in water compared with its speed in air is:

(A) about four times greater
(B) slightly smaller
(C) ten times smaller
(D) nearly the same

65. The speed of sound is highest in air at:

(A) 40°C
(B) 20°C
(C) 0°C
(D) –10°C

66. The unit of intensity of sound is:

(A) dB
(B) W/m^2
(C) m/s
(D) Hz

67. A sound of 0 dB corresponds approximately to the:

(A) normal conversation
(B) take-off of a jet plane
(C) threshold of pain
(D) threshold of hearing

68. Sound levels of about ____ and above are painful to the human ear.

(A) 60 dB
(B) 120 dB
(C) 10 dB
(D) 30 dB

69. A shrill sound has a:

(A) low amplitude
(B) long wavelength
(C) low frequency
(D) high frequency

70. A female voice is shriller than a male voice because it has a:

(A) higher frequency
(B) longer wavelength
(C) higher amplitude
(D) higher speed

71. Which of the following animals can hear ultrasonic sounds?

(A) Dog
(B) Jellyfish
(C) Snail
(D) Earthworm

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72. An aircraft flying at twice the speed of sound has a Mach number of:

(A) 0.5
(B) 1
(C) 2
(D) 4

73. Compressions and rarefactions are found in:

(A) longitudinal waves
(B) radio waves
(C) light waves
(D) transverse waves

74. Sound waves cannot be polarised because they are:

(A) electromagnetic waves
(B) always absorbed
(C) very slow waves
(D) longitudinal waves

75. The part of the ear that converts vibrations into electrical signals is the:

(A) Eustachian tube
(B) pinna
(C) eardrum
(D) cochlea

76. The time period of a wave of frequency 250 Hz is:

(A) 0.004 s
(B) 0.4 s
(C) 4 s
(D) 0.04 s

77. A wave of wavelength 2 m travels at 340 m/s. Its frequency is:

(A) 170 Hz
(B) 340 Hz
(C) 680 Hz
(D) 85 Hz

78. A sound of frequency 1000 Hz has a wavelength of 0.34 m. Its speed is:

(A) 34 m/s
(B) 340 m/s
(C) 3400 m/s
(D) 680 m/s

79. The wavelength of a 20 Hz sound in air (speed 340 m/s) is:

(A) 170 m
(B) 17 m
(C) 0.17 m
(D) 1.7 m

80. The SI unit of wavelength is:

(A) metre per second
(B) metre
(C) second
(D) hertz

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81. Which quantity of a wave depends only on its source?

(A) None of these
(B) Speed
(C) Wavelength
(D) Frequency

82. One hertz is equal to:

(A) one metre per second
(B) one wave per metre
(C) one oscillation per second
(D) one second per oscillation

83. The number of waves passing a point in one second is the:

(A) time period
(B) wavelength
(C) frequency
(D) amplitude

84. A tuning fork of frequency 512 Hz vibrates for 10 s. The number of vibrations is:

(A) 512
(B) 51.2
(C) 5120
(D) 10

85. On a hot day, the minimum distance of a reflector needed to hear an echo is:

(A) zero
(B) slightly greater than on a cold day
(C) slightly less than on a cold day
(D) exactly the same

86. A boy claps and hears an echo after 1 s. If the speed of sound is 340 m/s, the distance of the reflecting wall is:

(A) 85 m
(B) 340 m
(C) 170 m
(D) 680 m

87. Which of the following will give the best echo?

(A) A foam sheet
(B) A thick curtain
(C) A rocky cliff
(D) A cotton wall

88. An echo is not heard in a small room because:

(A) the reflected sound reaches the ear within 0.1 s
(B) the speed of sound is very small
(C) sound does not reflect from walls
(D) the walls absorb all the sound

89. A bat sends an ultrasonic pulse and receives its echo after 0.02 s. If the speed of sound is 340 m/s, the distance of the obstacle is:

(A) 3.4 m
(B) 0.34 m
(C) 6.8 m
(D) 1.7 m

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90. In the formation of an echo, the total distance travelled by sound is:

(A) four times the distance of the reflector
(B) equal to the distance of the reflector
(C) half the distance of the reflector
(D) twice the distance of the reflector

91. A megaphone sends sound in a particular direction mainly by:

(A) absorption of sound
(B) diffraction of sound
(C) repeated reflection of sound
(D) refraction of sound

92. The walls of a sound-proof room are covered with:

(A) glass sheets
(B) sound-absorbing materials
(C) mirrors
(D) metal sheets

93. SONAR was mainly developed for:

(A) detecting and locating underwater objects
(B) detecting aircraft in the sky
(C) measuring the speed of light
(D) measuring air temperature

94. Ultrasonic cleaning is especially useful for:

(A) heating food
(B) cleaning parts that are hard to reach
(C) making a sound louder
(D) measuring the depth of a well

95. The machine used to take images of a foetus using ultrasound is the:

(A) sphygmomanometer
(B) ECG machine
(C) X-ray machine
(D) ultrasonography machine

96. Dolphins use ultrasound to:

(A) make rainbows
(B) produce light underwater
(C) heat the water
(D) locate prey and obstacles in water

97. An ultrasonic pulse from a ship returns after 0.6 s. If the speed of sound in water is 1500 m/s, the depth of the sea is:

(A) 225 m
(B) 450 m
(C) 900 m
(D) 1800 m

98. A hearing aid is a device that:

(A) cancels all sounds
(B) amplifies sound for people with hearing difficulty
(C) reflects light into the ear
(D) converts light into sound

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99. Submarines under water are detected using:

(A) an ECG machine
(B) RADAR
(C) SONAR
(D) X-rays

100. Which of the following is NOT an application of ultrasound?

(A) Locating flaws in metals
(B) Cleaning electronic parts
(C) Imaging the foetus
(D) Producing X-ray images

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Answer Key

Q.	Ans	Q.	Ans	Q.	Ans	Q.	Ans	Q.	Ans
1	D	21	A	41	B	61	C	81	D
2	C	22	B	42	D	62	A	82	C
3	C	23	C	43	D	63	D	83	C
4	C	24	D	44	B	64	A	84	C
5	D	25	D	45	A	65	A	85	B
6	A	26	D	46	B	66	B	86	C
7	B	27	B	47	A	67	D	87	C
8	D	28	D	48	C	68	B	88	A
9	C	29	A	49	D	69	D	89	A
10	A	30	D	50	A	70	A	90	D
11	C	31	C	51	C	71	A	91	C
12	B	32	C	52	C	72	C	92	B
13	D	33	B	53	A	73	A	93	A
14	C	34	C	54	A	74	D	94	B
15	C	35	A	55	B	75	D	95	D
16	B	36	D	56	D	76	A	96	D
17	A	37	A	57	B	77	A	97	B
18	B	38	D	58	A	78	B	98	B
19	C	39	B	59	B	79	B	99	C
20	A	40	D	60	B	80	B	100	D

Poly Notes Hub

Physical Science: Light & Sound

100 Multiple Choice Questions for Government Job Examinations (Set 3)

1. The angle of reflection is the angle between the reflected ray and the:

(A) incident ray
(B) principal focus
(C) mirror surface
(D) normal

2. The incident ray, the reflected ray and the normal at the point of incidence lie:

(A) in three different planes
(B) in perpendicular planes
(C) in the same plane
(D) on the mirror surface

3. A ray strikes a plane mirror at an angle of incidence of 40°. The angle between the incident ray and the mirror surface is:

(A) 130°
(B) 80°
(C) 50°
(D) 40°

4. A plane mirror is rotated through 15° keeping the incident ray fixed. The reflected ray turns through:

(A) 60°
(B) 7.5°
(C) 30°
(D) 15°

5. An object is 1 m in front of a plane mirror. If it is moved 20 cm away from the mirror, its image will be at a distance of ____ from the mirror.

(A) 0.8 m
(B) 1.0 m
(C) 2.4 m
(D) 1.2 m

6. Two plane mirrors are inclined at 45°. The number of images formed is:

(A) 7
(B) 8
(C) 6
(D) 5

7. Which of the following spherical mirrors always forms an erect image?

(A) None of them
(B) Convex mirror
(C) Both concave and convex mirrors
(D) Concave mirror

8. A concave mirror has a focal length of 25 cm. An object is placed 50 cm from it. The image is formed:

(A) 100 cm in front of the mirror
(B) 25 cm in front of the mirror
(C) at infinity
(D) 50 cm in front of the mirror

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9. A concave mirror forms an image at infinity when the object is placed:

(A) at the centre of curvature
(B) beyond the centre of curvature
(C) at the principal focus
(D) at the pole

10. For a concave mirror, u = −30 cm and f = −10 cm. The image distance v is:

(A) −15 cm
(B) −10 cm
(C) −30 cm
(D) +15 cm

11. Real images formed by a concave mirror are always:

(A) diminished
(B) virtual
(C) inverted
(D) erect

12. Which of the following is NOT a property of the image formed by a plane mirror?

(A) It is virtual and erect
(B) It is real and inverted
(C) It is laterally inverted
(D) It is of the same size as the object

13. The magnification produced by a plane mirror is:

(A) 0
(B) −1
(C) 2
(D) +1

14. The aperture of a spherical mirror is:

(A) the height of the image
(B) its radius of curvature
(C) the diameter of its reflecting surface
(D) the distance between its pole and focus

15. The straight line passing through the pole and the centre of curvature of a spherical mirror is called its:

(A) aperture
(B) focal plane
(C) principal axis
(D) reflecting surface

16. When light enters a denser medium from a rarer medium, which of the following changes?

(A) Only frequency
(B) Speed and wavelength
(C) Frequency and speed
(D) Frequency and wavelength

17. Which colour of visible light has the highest frequency?

(A) Violet
(B) Green
(C) Yellow
(D) Red

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18. The refractive index of a medium is 1.5. The refractive index of air with respect to this medium is approximately:

(A) 3
(B) 0.67
(C) 0.5
(D) 1.5

19. Light travels from medium A (n = 1.2) into medium B (n = 1.6). The speed of light in B compared with that in A:

(A) remains the same
(B) increases
(C) decreases
(D) becomes zero

20. A straw appears bent in a glass of water due to:

(A) refraction of light
(B) scattering of light
(C) reflection of light
(D) dispersion of light

21. The refractive index of a transparent material medium is always:

(A) greater than 1
(B) equal to zero
(C) less than 1
(D) negative

22. A ray of light enters a glass slab along the normal (angle of incidence 0°). The angle of refraction is:

(A) 90°
(B) 0°
(C) 45°
(D) 30°

23. The critical angle of a medium is 30°. Its refractive index is:

(A) 3
(B) 0.5
(C) 2
(D) 1.5

24. Total internal reflection is made use of in:

(A) plane mirrors
(B) pin-hole cameras
(C) magnifying glasses
(D) prism binoculars

25. An endoscope used by doctors to see inside the body works with the help of:

(A) radio waves
(B) ultrasonic waves
(C) X-rays
(D) optical fibres

26. The band of colours obtained when white light is dispersed is called a:

(A) interference
(B) aperture
(C) polarisation
(D) spectrum

Poly Notes Hub

27. Who first obtained the spectrum of sunlight using a glass prism?

(A) C. V. Raman
(B) Isaac Newton
(C) Galileo Galilei
(D) Michael Faraday

28. C. V. Raman was awarded the Nobel Prize in Physics for his work on:

(A) reflection of light
(B) X-rays
(C) the speed of sound
(D) scattering of light

29. In Rayleigh scattering, the intensity of scattered light is proportional to:

(A) $1/\lambda^4$
(B) λ
(C) λ^4
(D) $1/\lambda$

30. A red object appears black when seen in green light because it:

(A) reflects green light
(B) emits red light
(C) transmits green light
(D) absorbs green light

31. The primary colours of light are:

(A) red, yellow and blue
(B) red, green and yellow
(C) red, green and blue
(D) cyan, magenta and yellow

32. A mixture of red and green light produces:

(A) blue light
(B) cyan light
(C) yellow light
(D) white light

33. A fish is at a real depth of 6 cm in water of refractive index 4/3. Seen from above, it appears at a depth of:

(A) 3 cm
(B) 4.5 cm
(C) 6 cm
(D) 8 cm

34. A ray of light passing through a glass prism bends towards its:

(A) edge
(B) apex
(C) base
(D) centre of the faces

35. An object is placed 5 cm from a convex lens of focal length 10 cm. The image is:

(A) virtual, erect and enlarged
(B) real and diminished
(C) real, inverted and enlarged
(D) virtual and diminished

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36. Two thin lenses of powers +4 D and −1 D are placed in contact. The power of the combination is:

(A) −3 D
(B) +5 D
(C) +4 D
(D) +3 D

37. One dioptre is equal to:

(A) one per metre
(B) one per centimetre
(C) one centimetre
(D) one metre

38. Two thin convex lenses, each of focal length 20 cm, are placed in contact. The focal length of the combination is:

(A) 5 cm
(B) 20 cm
(C) 40 cm
(D) 10 cm

39. An object is placed 20 cm from a concave lens of focal length −20 cm. The image distance is:

(A) +10 cm
(B) −10 cm
(C) −20 cm
(D) +20 cm

40. A lens produces a magnification of +3. The image is:

(A) virtual and diminished
(B) real, inverted and three times enlarged
(C) real and erect
(D) virtual, erect and three times enlarged

41. A convex lens can behave as a diverging lens when it is:

(A) cut into two halves
(B) placed in a medium of higher refractive index than the lens
(C) held very far from the object
(D) covered with black paper

42. If half of a convex lens is covered with black paper, the image of an object formed by it will be:

(A) only half of the object
(B) absent
(C) inverted and half-sized
(D) complete but less bright

43. The aperture of a lens refers to:

(A) its thickness at the centre
(B) the distance of the object
(C) its focal length
(D) the effective diameter of its circular outline

44. Which of the following convex lenses has the greatest converging power?

(A) Focal length 20 cm
(B) Focal length 5 cm
(C) Focal length 50 cm
(D) Focal length 10 cm

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45. A telescope has an objective lens of large aperture in order to:

(A) collect more light from distant objects
(B) reduce the size of the image
(C) absorb stray light
(D) reflect the light

46. The magnifying power of a simple microscope increases when the focal length of its lens:

(A) becomes infinite
(B) decreases
(C) remains the same
(D) increases

47. The image formed on the film of a camera can be projected on a screen because it is:

(A) real
(B) imaginary
(C) virtual
(D) formed behind the lens on the same side as the object

48. The lens of the human eye is:

(A) biconcave and rigid
(B) biconcave and flexible
(C) biconvex and flexible
(D) plane and rigid

49. The aqueous humour is found between the:

(A) iris and the sclera
(B) eye lens and the retina
(C) retina and the choroid
(D) cornea and the eye lens

50. The vitreous humour fills the space between the:

(A) eye lens and the retina
(B) iris and the pupil
(C) sclera and the choroid
(D) cornea and the iris

51. The approximate number of rod cells in the human retina is:

(A) 125 thousand
(B) 1 million
(C) 125 million
(D) 6 million

52. The approximate number of cone cells in the human retina is:

(A) 125 million
(B) 1 million
(C) 6 million
(D) 60 thousand

53. The size of the pupil in dim light is increased by the action of the muscles of the:

(A) iris
(B) cornea
(C) retina
(D) eye lens

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54. A person's far point is 50 cm. The lens needed to correct this defect has a power of:

(A) –2 D
(B) –0.5 D
(C) +0.5 D
(D) +2 D

55. A person's near point is 50 cm. To read comfortably at 25 cm, he needs a lens of power:

(A) +4 D
(B) +2 D
(C) –4 D
(D) –2 D

56. The lower part of a bifocal lens is used for:

(A) night vision
(B) colour vision
(C) distant vision
(D) near vision (reading)

57. Night blindness can be prevented by eating:

(A) sugar
(B) carrots and green leafy vegetables
(C) salt
(D) polished rice

58. Conjunctivitis is an infection or inflammation of the:

(A) conjunctiva
(B) eye lens
(C) retina
(D) optic nerve

59. The image on the retina is formed with the help of:

(A) only the pupil
(B) both the cornea and the eye lens
(C) only the sclera
(D) only the iris

60. The part of the human eye that acts like the film of a camera is the:

(A) iris
(B) retina
(C) cornea
(D) pupil

61. Having two eyes gives us:

(A) only night vision
(B) a smaller image
(C) a wider field of view and depth perception
(D) only colour vision

62. The yellow spot of the retina contains mostly:

(A) cone cells
(B) no cells at all
(C) rod cells
(D) blood vessels only

Poly Notes Hub

63. Which of the following is a mechanical wave?

(A) Light
(B) X-rays
(C) Radio waves
(D) Sound

64. The speed of sound in a medium depends on:

(A) the elasticity and density of the medium
(B) the loudness of the sound
(C) the amplitude of the wave
(D) the frequency of the source

65. The speed of sound in hydrogen is greater than that in air because hydrogen is:

(A) much lighter than air
(B) coloured
(C) much heavier than air
(D) denser than air

66. Among the following, the speed of sound is the highest in:

(A) air
(B) iron
(C) oxygen
(D) water

67. Prolonged exposure to sound above about ____ can damage hearing.

(A) 30 dB
(B) 40 dB
(C) 20 dB
(D) 85 dB

68. The eardrum is also known as the:

(A) pinna
(B) tympanic membrane
(C) cochlea
(D) stapes

69. A tuning fork vibrates at 256 Hz. The number of compressions it produces per second is:

(A) 1
(B) 512
(C) 128
(D) 256

70. Among sounds of 20 Hz, 200 Hz, 2000 Hz and 20,000 Hz in the same medium, the longest wavelength belongs to:

(A) 20 Hz
(B) 20,000 Hz
(C) 200 Hz
(D) 2000 Hz

71. The sound of a bell becomes fainter as we move away from it because:

(A) its intensity decreases as the wave spreads out
(B) its pitch becomes lower
(C) its speed decreases
(D) its frequency decreases

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72. Ultrasound used in medical imaging typically has a frequency of:

(A) 20 Hz
(B) 200 Hz
(C) 1 to 15 MHz
(D) 2 kHz

73. Bats can hear sounds of frequency up to approximately:

(A) 120 kHz
(B) 200 Hz
(C) 20 Hz
(D) 2 kHz

74. Infrasonic waves are produced during:

(A) playing a flute
(B) ringing a bell
(C) blowing a whistle
(D) earthquakes

75. The Doppler effect is named after:

(A) Heinrich Hertz
(B) C. V. Raman
(C) Isaac Newton
(D) Christian Doppler

76. The SI unit of frequency is named after:

(A) Heinrich Hertz
(B) Isaac Newton
(C) Christian Doppler
(D) Alexander Graham Bell

77. A sound wave transports:

(A) energy but not matter
(B) both matter and energy
(C) matter but not energy
(D) neither energy nor matter

78. A source vibrates 600 times in 3 seconds. Its frequency is:

(A) 1800 Hz
(B) 200 Hz
(C) 0.005 Hz
(D) 20 Hz

79. The wavelength of a 680 Hz sound in air (speed 340 m/s) is:

(A) 0.25 m
(B) 0.5 m
(C) 1 m
(D) 2 m

80. A wave travels at 1500 m/s and has a wavelength of 3 m. Its frequency is:

(A) 1500 Hz
(B) 500 Hz
(C) 50 Hz
(D) 4500 Hz

Poly Notes Hub

81. A wave has a time period of 0.05 s. Its frequency is:

(A) 200 Hz
(B) 2 Hz
(C) 0.05 Hz
(D) 20 Hz

82. Sound travels at 330 m/s and has a frequency of 110 Hz. Its wavelength is:

(A) 0.33 m
(B) 33 m
(C) 3 m
(D) 30 m

83. A sound wave passes from medium A into medium B where its speed is double. Its wavelength in B is:

(A) zero
(B) halved
(C) doubled
(D) unchanged

84. One megahertz (1 MHz) is equal to:

(A) 10^3 Hz
(B) 10^9 Hz
(C) 10^6 Hz
(D) 10^{12} Hz

85. A person stands 85 m from a wall and claps. If the speed of sound is 340 m/s, the echo is heard after:

(A) 2 s
(B) 0.5 s
(C) 1 s
(D) 0.25 s

86. An echo is heard 4 s after a shout. If the speed of sound is 340 m/s, the reflecting surface is at a distance of:

(A) 340 m
(B) 1360 m
(C) 680 m
(D) 170 m

87. An echo differs from reverberation because an echo:

(A) occurs only under water
(B) occurs only in small rooms
(C) is heard as a separate sound after the original
(D) merges with the original sound

88. Which of the following absorbs sound best?

(A) A heavy curtain
(B) A glass sheet
(C) Polished marble
(D) A metal sheet

89. Echo sounding is the method of:

(A) measuring the depth of the sea using the echo of ultrasonic waves
(B) finding the direction of wind
(C) measuring the speed of light
(D) measuring the temperature of water

Poly Notes Hub

90. An echo is heard 0.2 s after a shout. If the speed of sound is 340 m/s, the reflecting surface is at:

(A) 6.8 m
(B) 68 m
(C) 17 m
(D) 34 m

91. A ship's SONAR receives the echo from the sea bed after 6 s. If the speed of sound in water is 1500 m/s, the depth is:

(A) 1500 m
(B) 2250 m
(C) 4500 m
(D) 9000 m

92. Which law of reflection also applies to the reflection of sound?

(A) Law of floatation
(B) Angle of incidence equals angle of reflection
(C) Snell's law
(D) Ohm's law

93. In a SONAR, the device that produces ultrasonic waves is the:

(A) transmitter
(B) compass
(C) detector
(D) screen only

94. In a SONAR, the echo is received by the:

(A) battery
(B) detector
(C) compass
(D) transmitter

95. RADAR is mainly used to detect:

(A) coral reefs
(B) fish shoals
(C) submarines in the sea
(D) aircraft

96. Which of the following makes use of infrasound?

(A) Detecting cracks in metals
(B) Cleaning jewellery
(C) Imaging the heart
(D) Monitoring earthquakes and volcanic activity

97. A dog whistle produces:

(A) X-rays
(B) ultrasonic sound
(C) infrasonic sound
(D) radio waves

98. Doppler ultrasound is used in medicine to measure:

(A) lung size
(B) blood flow
(C) eye colour
(D) body temperature

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99. Ultrasonic waves are preferred in SONAR because they:

(A) need no medium
(B) travel faster than light
(C) travel as narrow beams and can be directed
(D) are louder to human ears

100. Whales communicate over long distances in water using:

(A) radio waves
(B) X-rays
(C) light signals
(D) low-frequency (infrasonic) sounds

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Answer Key

Q.	Ans	Q.	Ans	Q.	Ans	Q.	Ans	Q.	Ans
1	D	21	A	41	B	61	C	81	D
2	C	22	B	42	D	62	A	82	C
3	C	23	C	43	D	63	D	83	C
4	C	24	D	44	B	64	A	84	C
5	D	25	D	45	A	65	A	85	B
6	A	26	D	46	B	66	B	86	C
7	B	27	B	47	A	67	D	87	C
8	D	28	D	48	C	68	B	88	A
9	C	29	A	49	D	69	D	89	A
10	A	30	D	50	A	70	A	90	D
11	C	31	C	51	C	71	A	91	C
12	B	32	C	52	C	72	C	92	B
13	D	33	B	53	A	73	A	93	A
14	C	34	C	54	A	74	D	94	B
15	C	35	A	55	B	75	D	95	D
16	B	36	D	56	D	76	A	96	D
17	A	37	A	57	B	77	A	97	B
18	B	38	D	58	A	78	B	98	B
19	C	39	B	59	B	79	B	99	C
20	A	40	D	60	B	80	B	100	D

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Physical Science: Light & Sound

100 Multiple Choice Questions for Government Job Examinations (Set 4)

1. Which of the following is a luminous object?

(A) A mirror
(B) A planet
(C) The Moon
(D) The Sun

2. Light travels in a straight line in a:

(A) non-uniform medium only
(B) vacuum only
(C) uniform transparent medium
(D) opaque medium

3. The Moon shines because it:

(A) emits heat only
(B) absorbs all light
(C) reflects sunlight
(D) produces its own light

4. The time taken by light to travel from the Sun to the Earth is approximately:

(A) 1 minute
(B) 8 hours
(C) 8 minutes 20 seconds
(D) 1.3 seconds

5. A shadow is formed because light:

(A) bends around an opaque object
(B) is absorbed by air
(C) changes its colour
(D) travels in straight lines and cannot pass through an opaque object

6. Which of the following materials is translucent?

(A) Butter paper
(B) Clear glass
(C) Wood
(D) Brick

7. A man 1.6 m tall stands 2 m in front of a plane mirror. The distance between him and his image is:

(A) 3.2 m
(B) 4 m
(C) 1.6 m
(D) 2 m

8. A convex mirror has a focal length of 20 cm. An object is placed 20 cm in front of it. The image distance is:

(A) −10 cm
(B) +20 cm
(C) +40 cm
(D) +10 cm

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9. The magnification produced by a convex mirror is always:

(A) negative
(B) zero
(C) positive and less than 1
(D) greater than 1

10. An object is 10 cm from a concave mirror of focal length 15 cm. The magnification is:

(A) +3
(B) –1.5
(C) –3
(D) +1.5

11. Reflecting telescopes use:

(A) a prism only
(B) a plane mirror only
(C) a large concave mirror as the objective
(D) a convex mirror as the objective

12. Which of the following can form a real image?

(A) Convex mirror
(B) Concave mirror
(C) Plane mirror
(D) Concave lens

13. The radius of curvature of a plane mirror is:

(A) 1 metre
(B) zero
(C) equal to its focal length
(D) infinity

14. In the Cartesian sign convention, distances measured in the direction of the incident light are taken as:

(A) imaginary
(B) zero
(C) positive
(D) negative

15. The ratio of the height of the image to the height of the object is called:

(A) power
(B) aperture
(C) magnification
(D) focal length

16. The speed of light is maximum in:

(A) water
(B) vacuum
(C) glass
(D) diamond

17. Among water, glass, diamond and air, the speed of light is the lowest in:

(A) diamond
(B) glass
(C) air
(D) water

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18. Light bends more when it enters:

(A) vacuum only
(B) a medium of higher refractive index
(C) a medium with the same refractive index
(D) a medium of lower refractive index

19. A ray of light at an angle of incidence equal to the critical angle (going from a denser to a rarer medium) emerges:

(A) at 45° to the normal
(B) along the normal
(C) along the boundary between the two media
(D) back into the denser medium

20. Total internal reflection cannot occur when light travels from:

(A) a rarer medium to a denser medium
(B) diamond to air
(C) glass to air
(D) water to air

21. The refractive index of vacuum is:

(A) 1
(B) infinity
(C) 0
(D) 1.5

22. In a secondary rainbow, light undergoes ____ internal reflections inside each water drop.

(A) no
(B) two
(C) three
(D) one

23. The colours of the spectrum arranged in order of increasing wavelength begin with:

(A) blue
(B) red
(C) violet
(D) green

24. Which of these colours is scattered the most by air molecules?

(A) Red
(B) Yellow
(C) Green
(D) Blue

25. The Tyndall effect is NOT observed in:

(A) smoke
(B) milk
(C) fog
(D) a true solution of salt in water

26. Which of the following is caused by atmospheric refraction?

(A) Phases of the Moon
(B) Formation of a shadow
(C) A lunar eclipse
(D) The flattened appearance of the Sun at sunrise

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27. A lunar eclipse occurs because of:

(A) scattering of light
(B) rectilinear propagation of light
(C) refraction of light
(D) dispersion of light

28. Which of the following is NOT split into colours by a prism?

(A) Sunlight
(B) Light from a tube light
(C) White light
(D) Monochromatic light

29. A beam of white light passes through a rectangular glass slab. The emergent beam is:

(A) white light
(B) only violet
(C) split into seven colours
(D) only red

30. The refractive index of water is 4/3 and that of glass is 3/2. The refractive index of glass with respect to water is:

(A) 8/9
(B) 3/2
(C) 4/3
(D) 9/8

31. The speed of light in a medium is 2×10^8 m/s. Its refractive index is:

(A) 0.67
(B) 3
(C) 1.5
(D) 2

32. Light of wavelength λ in air enters glass of refractive index 1.5. Its wavelength in glass becomes:

(A) λ
(B) 3λ
(C) $\lambda/1.5$
(D) 1.5λ

33. The lateral displacement of a ray passing through a glass slab depends on:

(A) the temperature of the room only
(B) the thickness of the slab, the angle of incidence and the refractive index
(C) the area of the slab only
(D) the colour of the slab only

34. The optical density of a medium is related to:

(A) its colour
(B) its mass density only
(C) the speed of light in it
(D) its temperature only

35. The point on the principal axis to which a parallel beam converges after passing through a convex lens is the:

(A) principal focus
(B) aperture
(C) optical centre
(D) pole

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36. The number of principal foci of a lens is:

(A) four
(B) one
(C) infinite
(D) two

37. The focal length of a convex lens is measured in:

(A) metre (or centimetre)
(B) hertz
(C) watt
(D) dioptre

38. An object is placed 10 cm from a convex lens of focal length 20 cm. The image distance is:

(A) +10 cm
(B) –10 cm
(C) +20 cm
(D) –20 cm

39. A lens has a power of +0.5 D. Its focal length is:

(A) 50 cm
(B) 2 m
(C) 0.5 m
(D) 5 m

40. A concave lens has a focal length of –10 cm. Its power is:

(A) –1 D
(B) +10 D
(C) –0.1 D
(D) –10 D

41. Lenses of powers +3 D and –5 D are placed in contact. The power of the combination is:

(A) +2 D
(B) –2 D
(C) +8 D
(D) –8 D

42. An object is placed 15 cm from a convex lens of focal length 10 cm. The image distance is:

(A) +6 cm
(B) –30 cm
(C) +15 cm
(D) +30 cm

43. The image formed by a convex lens of an object at infinity is:

(A) virtual and enlarged
(B) virtual and erect
(C) real and enlarged
(D) real, inverted and highly diminished

44. The final image formed by the eyepiece of a compound microscope is:

(A) real and erect
(B) virtual, enlarged and inverted relative to the object
(C) virtual and diminished
(D) real and diminished

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45. Chromatic aberration in a lens is caused by:

(A) different colours having different focal lengths
(B) reflection from the lens
(C) absorption of light by the lens
(D) the thickness of a mirror

46. A lens having a negative focal length is:

(A) a prism
(B) a concave lens
(C) a plane glass slab
(D) a convex lens

47. A convex lens of focal length 10 cm forms a real image at 20 cm from it. The object distance is:

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

48. Which of the following is true for a convex lens?

(A) It forms only diminished images
(B) It forms only real images
(C) It can form both real and virtual images
(D) It forms only virtual images

49. Which defect arises when the eyeball is too long?

(A) Cataract
(B) Hypermetropia
(C) Presbyopia
(D) Myopia

50. Hypermetropia arises when the eyeball is:

(A) too short
(B) too wide
(C) perfectly spherical
(D) too long

51. A myopic person has a far point at 1 m. The power of the corrective lens is:

(A) +2 D
(B) –0.5 D
(C) –1 D
(D) +1 D

52. Light entering the eye first passes through the:

(A) eye lens
(B) pupil
(C) cornea
(D) retina

53. The correct order in which light passes through the eye is:

(A) cornea, pupil, lens, retina
(B) lens, cornea, pupil, retina
(C) retina, lens, pupil, cornea
(D) pupil, cornea, retina, lens

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54. The brain interprets the inverted image formed on the retina as:

(A) erect
(B) blurred
(C) coloured
(D) inverted

55. A person with astigmatism sees:

(A) only at night
(B) lines in one direction blurred
(C) all objects double-coloured
(D) everything in black and white

56. Daltonism is another name for:

(A) glaucoma
(B) cataract
(C) night blindness
(D) colour blindness

57. Trachoma is:

(A) clouding of the eye lens
(B) a bacterial infection of the eye
(C) caused by lack of Vitamin A
(D) a defect caused by the lens

58. Dryness of the cornea (xerophthalmia) is caused by the deficiency of:

(A) Vitamin A
(B) Vitamin C
(C) Vitamin D
(D) Vitamin K

59. A film is shown at 24 frames per second and looks continuous because the interval between frames (1/24 s) is:

(A) equal to 1 s
(B) less than 1/16 s
(C) zero
(D) more than 1/16 s

60. The optic nerve carries:

(A) blood to the retina
(B) electrical signals from the retina to the brain
(C) light rays to the retina
(D) tears to the cornea

61. The sclera is:

(A) the coloured part of the eye
(B) the light-sensitive layer
(C) the white, tough outer protective layer of the eye
(D) the transparent front layer

62. Sound waves in solids can be:

(A) both longitudinal and transverse
(B) neither longitudinal nor transverse
(C) only longitudinal
(D) only transverse

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63. In which of the following can only longitudinal sound waves travel?

(A) Steel
(B) Rock
(C) Wood
(D) Air and water

64. The speed of sound in air at 20°C is 343 m/s. In km/h this is approximately:

(A) 1235 km/h
(B) 12,350 km/h
(C) 3430 km/h
(D) 343 km/h

65. An increase of 10 dB in sound level means the sound intensity:

(A) increases 10 times
(B) increases by 10 W/m^2
(C) doubles
(D) remains the same

66. The pitch of the sound from a vibrating string increases when its length:

(A) remains the same
(B) decreases
(C) has no effect
(D) increases

67. Which of the following is a percussion instrument?

(A) Flute
(B) Violin
(C) Sitar
(D) Tabla

68. Which of the following is a wind instrument?

(A) Drum
(B) Flute
(C) Tabla
(D) Sitar

69. Which of the following is a string instrument?

(A) Dholak
(B) Tabla
(C) Shehnai
(D) Sitar

70. A sound of low frequency is called:

(A) a low-pitched (bass) sound
(B) a noise
(C) a shrill sound
(D) an ultrasound

71. The hearing range of an old person compared with that of a young person:

(A) is reduced, especially for high frequencies
(B) extends beyond 20 kHz
(C) is unchanged
(D) is increased

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72. Noise pollution can cause:

(A) improved memory
(B) better sleep
(C) hearing loss and high blood pressure
(D) faster growth

73. Thunder is heard 3 s after a lightning flash. If the speed of sound is 340 m/s, the lightning is at a distance of:

(A) 1020 m
(B) 510 m
(C) 2040 m
(D) 340 m

74. Resonance occurs when the natural frequency of a body equals:

(A) zero
(B) the amplitude of the force
(C) double the applied frequency
(D) the frequency of an applied periodic force

75. Soldiers are told to break step while crossing a bridge to avoid:

(A) the Doppler effect
(B) reverberation
(C) echo
(D) resonance

76. The hammer, anvil and stirrup are found in the:

(A) middle ear
(B) outer ear
(C) nose
(D) inner ear

77. A wave has a frequency of 5 Hz and a speed of 20 m/s. Its wavelength is:

(A) 4 m
(B) 15 m
(C) 100 m
(D) 0.25 m

78. The time period of a wave of frequency 2 kHz is:

(A) 2 ms
(B) 0.5 ms
(C) 5 ms
(D) 0.2 ms

79. In $v = f\lambda$, if v is constant and f becomes three times, the wavelength:

(A) remains the same
(B) becomes one-third
(C) becomes nine times
(D) becomes three times

80. A sound wave of wavelength 2 m and frequency 170 Hz has a time period of:

(A) 340 s
(B) 1/170 s
(C) 2 s
(D) 170 s

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81. The distance between a compression and the next rarefaction is:

(A) one-fourth of the wavelength
(B) twice the wavelength
(C) one full wavelength
(D) half of the wavelength

82. A source produces 100 compressions per second and the wavelength is 3.4 m. The speed of the wave is:

(A) 34 m/s
(B) 100 m/s
(C) 340 m/s
(D) 3400 m/s

83. Which pair of quantities are reciprocals of each other?

(A) Pitch and quality
(B) Speed and wavelength
(C) Frequency and time period
(D) Amplitude and loudness

84. An echo from a cliff is heard 1.5 s after a shout. If the speed of sound is 340 m/s, the cliff is at:

(A) 510 m
(B) 340 m
(C) 255 m
(D) 127.5 m

85. In SONAR the measured time is divided by 2 to find the depth because:

(A) the ship is moving
(B) the sound travels to the bottom and back
(C) the sound travels at half speed
(D) two pulses are sent

86. An echo is most likely to be heard:

(A) in a crowded bus
(B) in a small carpeted room
(C) near a large hill in an open field
(D) in a bed of cotton

87. Sound-absorbing ceiling tiles are made with:

(A) a glass layer
(B) a metal coating
(C) many small holes (perforations) that trap sound
(D) a smooth shiny surface

88. Which of the following is NOT based on reflection of sound?

(A) Formation of a rainbow
(B) SONAR
(C) Echo
(D) Stethoscope

89. A wall is 51 m away. If the speed of sound is 340 m/s, the echo of a clap is heard after:

(A) 0.3 s
(B) 1.5 s
(C) 0.15 s
(D) 0.6 s

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90. In a valley a shout is heard as an echo after 2 s from one side and after 3 s from the other. If the speed of sound is 340 m/s, the width of the valley is:

(A) 1020 m
(B) 1700 m
(C) 340 m
(D) 850 m

91. If the speed of sound became double, the minimum distance of a reflector required for an echo would:

(A) become zero
(B) remain the same
(C) become double
(D) become half

92. Ultrasound imaging can distinguish between tissues because they:

(A) emit light
(B) reflect ultrasound differently
(C) have different colours
(D) are at the same temperature

93. In ultrasonic cleaning, dirt is removed by:

(A) high-frequency vibrations in a cleaning liquid
(B) scraping with a brush
(C) heating with a flame
(D) ultraviolet light

94. The clicks used by dolphins for echolocation are in the:

(A) X-ray range
(B) ultrasonic range
(C) radio range
(D) infrasonic range

95. Sonography is preferred to X-rays for:

(A) testing eyesight
(B) locating a bone fracture only
(C) measuring blood sugar
(D) examining a foetus during pregnancy

96. In echocardiography, ultrasound is reflected from:

(A) the hair
(B) the bones of the leg
(C) the teeth
(D) the walls and valves of the heart

97. An advantage of ultrasound in testing metal parts is that:

(A) the metal changes colour
(B) the metal is not damaged during testing
(C) the metal melts
(D) the metal becomes magnetic

98. Echo ranging means:

(A) finding the temperature of the air
(B) finding the distance of an object from the time taken by its echo
(C) measuring the colour of an object
(D) measuring the weight of an object

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99. Ultrasonic waves are produced using the principle of the:

(A) Doppler effect
(B) photoelectric effect
(C) piezoelectric effect
(D) electromagnetic induction

100. Which material is commonly used to produce ultrasound?

(A) Glass rod
(B) Copper wire
(C) Rubber
(D) Quartz crystal

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Answer Key

Q.	Ans	Q.	Ans	Q.	Ans	Q.	Ans	Q.	Ans
1	D	21	A	41	B	61	C	81	D
2	C	22	B	42	D	62	A	82	C
3	C	23	C	43	D	63	D	83	C
4	C	24	D	44	B	64	A	84	C
5	D	25	D	45	A	65	A	85	B
6	A	26	D	46	B	66	B	86	C
7	B	27	B	47	A	67	D	87	C
8	D	28	D	48	C	68	B	88	A
9	C	29	A	49	D	69	D	89	A
10	A	30	D	50	A	70	A	90	D
11	C	31	C	51	C	71	A	91	C
12	B	32	C	52	C	72	C	92	B
13	D	33	B	53	A	73	A	93	A
14	C	34	C	54	A	74	D	94	B
15	C	35	A	55	B	75	D	95	D
16	B	36	D	56	D	76	A	96	D
17	A	37	A	57	B	77	A	97	B
18	B	38	D	58	A	78	B	98	B
19	C	39	B	59	B	79	B	99	C
20	A	40	D	60	B	80	B	100	D

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Physical Science: Light & Sound

100 Multiple Choice Questions for Government Job Examinations (Set 5)

1. A plane mirror forms an image 5 m behind it. The object is at a distance of ____ in front of the mirror.

(A) 10 m
(B) 0 m
(C) 2.5 m
(D) 5 m

2. A ray of light is incident on a plane mirror at an angle of incidence of 60°. The angle through which the ray is turned (deviation) is:

(A) 120°
(B) 30°
(C) 60°
(D) 180°

3. The image of the letter 'p' seen in a plane mirror looks like:

(A) p
(B) d
(C) q
(D) b

4. For a concave mirror, u = −15 cm and f = −10 cm. The image distance v is:

(A) −15 cm
(B) +30 cm
(C) −30 cm
(D) −6 cm

5. A concave mirror forms a real image of the same size as the object at 24 cm in front of the mirror. Its focal length is:

(A) 24 cm
(B) 48 cm
(C) 6 cm
(D) 12 cm

6. A convex mirror has a focal length of 15 cm. For an object at infinity, the image is formed at:

(A) +15 cm (behind the mirror)
(B) −15 cm (in front of the mirror)
(C) +30 cm
(D) infinity

7. The image formed by a convex mirror is located:

(A) at the centre of curvature
(B) behind the mirror between its pole and focus
(C) at infinity
(D) in front of the mirror

8. A mirror forms an enlarged, erect image of an object. The mirror is:

(A) a plane mirror
(B) a convex mirror
(C) none of these
(D) a concave mirror

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9. The image of a vehicle seen in a rear-view mirror appears:

(A) larger and inverted
(B) real
(C) smaller and erect
(D) of the same size and inverted

10. For a plane mirror, the mirror formula gives the image distance as:

(A) $v = -u$
(B) $v = 0$
(C) $v = u$
(D) $v = 2u$

11. The laws of reflection are obeyed:

(A) only for concave mirrors
(B) only for convex mirrors
(C) for both plane and curved mirrors
(D) only for plane mirrors

12. The reflecting surface of a convex mirror is:

(A) its inner hollow surface
(B) its outer bulging surface
(C) both of its surfaces
(D) a flat surface

13. The distance between the pole and the centre of curvature of a mirror of focal length 12 cm is:

(A) 6 cm
(B) 12 cm
(C) 48 cm
(D) 24 cm

14. A thick glass block placed over a printed page makes the letters appear:

(A) exactly at the same place
(B) inverted
(C) raised (nearer to the observer)
(D) lowered

15. The speed of light in a medium is 1.5×10^8 m/s. Its refractive index is:

(A) 0.5
(B) 1.5
(C) 2
(D) 4.5

16. A ray of light enters water from air at an angle of incidence of 45°. The angle of refraction is:

(A) more than 45°
(B) less than 45°
(C) exactly 45°
(D) 90°

17. For light going from air into glass, sin i / sin r = 1.5. The ratio of the speed of light in air to that in glass is:

(A) 1.5
(B) 3
(C) 2.25
(D) 0.67

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18. A smaller critical angle indicates:

(A) no change in refractive index
(B) a higher refractive index
(C) a lower density only
(D) a lower refractive index

19. When light goes from air into glass, which quantity remains unchanged?

(A) Wavelength
(B) Speed
(C) Frequency
(D) Direction in all cases

20. Mirages are commonly seen in:

(A) deserts and on hot roads in summer
(B) under water
(C) snow-covered fields at night
(D) dense forests in the monsoon

21. The apparent water seen on a hot road in a mirage is actually:

(A) an image of the sky formed by total internal reflection
(B) a shadow of the road
(C) a puddle of water
(D) a reflection of the road

22. In an optical fibre, the cladding has:

(A) zero refractive index
(B) a lower refractive index than the core
(C) the same refractive index as the core
(D) a higher refractive index than the core

23. One important use of optical fibres is in:

(A) producing sound
(B) measuring the temperature of the Sun
(C) broadband internet and telephone cables
(D) cutting wood

24. A rainbow can also be seen:

(A) in a dark room
(B) at midnight
(C) inside a glass block
(D) near a waterfall or in the spray of a fountain

25. The colour at the inner edge of the primary rainbow is:

(A) yellow
(B) red
(C) green
(D) violet

26. At noon the Sun appears white because:

(A) the sky absorbs all colours
(B) blue light is absent in sunlight
(C) red light is absorbed by the sky
(D) little scattering occurs as sunlight travels a shorter path through the atmosphere

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27. The sky appears blue and not violet mainly because:

(A) violet light has the longest wavelength
(B) our eyes are more sensitive to blue and sunlight has less violet
(C) violet light is not scattered
(D) violet light is the slowest

28. Which of the following is a refracting device?

(A) Concave mirror
(B) Convex mirror
(C) Plane mirror
(D) Convex lens

29. The angle between the refracted ray and the normal is called the angle of:

(A) refraction
(B) reflection
(C) deviation
(D) incidence

30. The minimum angle of incidence for total internal reflection from a denser to a rarer medium is called the:

(A) angle of deviation
(B) Brewster angle
(C) angle of refraction
(D) critical angle

31. A swimming pool appears ____ than its real depth when seen from above.

(A) deeper
(B) bluer only
(C) shallower
(D) equally deep

32. At the critical angle of incidence, the angle of refraction in the rarer medium is:

(A) 45°
(B) 180°
(C) 90°
(D) 0°

33. A disc painted with the seven colours of the spectrum, when spun rapidly, appears:

(A) violet
(B) white
(C) red
(D) black

34. If the refractive index of a medium is 1.5, the value of sin c for it is:

(A) 1
(B) 3/2
(C) 2/3
(D) 1/3

35. The refractive index of kerosene is 1.44. The speed of light in kerosene is approximately:

(A) 2.08×10^8 m/s
(B) 3×10^8 m/s
(C) 4.32×10^8 m/s
(D) 1.44×10^8 m/s

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36. A convex lens produces a magnification of −2 for an object 15 cm from the lens. The image distance is:

(A) −30 cm
(B) +7.5 cm
(C) +15 cm
(D) +30 cm

37. A lens has a focal length of 10 cm in air. Its power is:

(A) +10 D
(B) −10 D
(C) +0.1 D
(D) +1 D

38. A virtual image formed by a lens is always:

(A) diminished
(B) real
(C) inverted
(D) erect

39. A thin lens of zero power behaves like:

(A) a concave lens
(B) a plane glass plate
(C) a convex lens
(D) a prism

40. Which of the following can NEVER form a real image?

(A) Concave mirror
(B) Convex lens
(C) Both convex lens and concave mirror
(D) Concave lens

41. A lens has a focal length of 20 cm. Its power is:

(A) +20 D
(B) +5 D
(C) +2 D
(D) +0.05 D

42. An object is 60 cm from a convex lens of focal length 20 cm. The image distance is:

(A) −30 cm
(B) +15 cm
(C) +60 cm
(D) +30 cm

43. For the above lens (u = −60 cm, f = +20 cm) the magnification is:

(A) +0.5
(B) +2
(C) −2
(D) −0.5

44. A thin convex lens and a thin concave lens of equal power are placed in contact. The net power is:

(A) infinite
(B) zero
(C) half
(D) double

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45. The eyepiece of a telescope is:

(A) a convex lens of short focal length
(B) a concave mirror
(C) a plane mirror
(D) a prism

46. A magnifying glass is held at a distance greater than its focal length from the object. The image is:

(A) formed at the lens
(B) real and inverted
(C) virtual and enlarged
(D) virtual and erect

47. The number of refracting surfaces in a lens is:

(A) two
(B) three
(C) one
(D) four

48. The focal length of a lens does NOT depend on:

(A) the medium surrounding the lens
(B) the radius of curvature of its surfaces
(C) the distance of the object
(D) the refractive index of the lens material

49. The slow adjustment of the eye on entering a dim room is called:

(A) refraction
(B) accommodation
(C) persistence of vision
(D) dark adaptation

50. The colour of the iris is due to the pigment:

(A) melanin
(B) chlorophyll
(C) rhodopsin
(D) haemoglobin

51. In presbyopia the eye lens loses its:

(A) shape permanently
(B) colour
(C) flexibility
(D) transparency completely

52. The near point of a hypermetropic eye is:

(A) less than 25 cm from the eye
(B) exactly 25 cm from the eye
(C) more than 25 cm from the eye
(D) at the eye itself

53. The far point of a myopic eye is:

(A) nearer than infinity
(B) beyond infinity
(C) always at 25 cm
(D) at infinity

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54. Rods and cones are together called:

(A) photoreceptors
(B) mechanoreceptors
(C) thermoreceptors
(D) chemoreceptors

55. The light-sensitive cells of the retina convert light into:

(A) sound
(B) electrical impulses
(C) magnetic fields
(D) heat

56. Sight can be restored by a corneal transplant when the damage is to the:

(A) brain
(B) optic nerve
(C) retina
(D) cornea

57. Which of the following can be treated by replacing the eye lens surgically?

(A) Colour blindness
(B) Cataract
(C) Daltonism
(D) Night blindness

58. A person is prescribed spectacles of power −2.5 D. The defect is most likely:

(A) myopia
(B) hypermetropia
(C) presbyopia
(D) cataract

59. A person is prescribed reading glasses of power +1.5 D. The defect is most likely:

(A) night blindness
(B) hypermetropia or presbyopia
(C) colour blindness
(D) myopia

60. The amount of light entering the eye is regulated by changing the:

(A) thickness of the cornea
(B) size of the pupil
(C) size of the eyeball
(D) length of the optic nerve

61. Tears help the eye by:

(A) absorbing light
(B) producing colour
(C) keeping it moist and washing away dust
(D) focusing light

62. Sound waves transfer energy by:

(A) vibration of the particles of the medium
(B) gravity
(C) movement of the medium as a whole
(D) an electric field

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63. The upper limit of human hearing is about:

(A) 2 kHz
(B) 200 Hz
(C) 20 Hz
(D) 20 kHz

64. Which of the following has a higher frequency (shriller sound)?

(A) A whistle
(B) Thunder
(C) A bass guitar
(D) A drum

65. The speed of sound in air is approximately ____ of the speed of light.

(A) one-millionth
(B) one-hundredth
(C) one-tenth
(D) equal

66. A tuning fork sounds louder when its stem is pressed on a table because:

(A) the speed of sound increases
(B) the table vibrates and sets a larger area of air in motion
(C) the temperature of the fork increases
(D) the frequency increases

67. If the distance from a point source of sound is doubled, the intensity becomes:

(A) double
(B) the same
(C) half
(D) one-fourth

68. A sound of 40 dB compared with a sound of 20 dB has an intensity that is:

(A) 10 times greater
(B) 100 times greater
(C) 2 times greater
(D) 20 times greater

69. Sound in human beings is produced by the:

(A) nose
(B) lungs only
(C) tongue only
(D) vocal cords in the larynx

70. On a cold day, sound travels:

(A) slower than on a hot day
(B) not at all
(C) faster than on a hot day
(D) at exactly the same speed

71. The sound of a distant train is heard earlier through the rails than through air because:

(A) sound travels faster in steel than in air
(B) rails are hot
(C) air absorbs all the sound
(D) rails are louder than air

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72. The Mach number of an object moving at the speed of sound is:

(A) 0
(B) 2
(C) 1
(D) 10

73. A jet flies at Mach 3 in air where the speed of sound is 340 m/s. Its speed is:

(A) 1020 m/s
(B) 3400 m/s
(C) 113 m/s
(D) 340 m/s

74. Which of the following has a speed of sound LESS than that in air?

(A) Water
(B) Steel
(C) Hydrogen
(D) Oxygen

75. The Doppler effect is observed for:

(A) neither sound nor light waves
(B) only light waves
(C) only sound waves
(D) both sound and light waves

76. A sound level meter measures:

(A) loudness in decibels
(B) pitch in hertz
(C) wavelength of sound
(D) speed of sound

77. A wave has a speed of 360 m/s and a wavelength of 0.9 m. Its frequency is:

(A) 400 Hz
(B) 4 Hz
(C) 324 Hz
(D) 0.0025 Hz

78. A pendulum completes 30 oscillations in 15 s. Its frequency is:

(A) 0.5 Hz
(B) 2 Hz
(C) 15 Hz
(D) 450 Hz

79. A 1 kHz sound travels in water at 1500 m/s. Its wavelength is:

(A) 15 m
(B) 1.5 m
(C) 0.15 m
(D) 0.34 m

80. The audible range of sound corresponds to wavelengths in air (at about 340 m/s) of roughly:

(A) 1.7 m to 170 m
(B) 1.7 cm to 17 m
(C) 1.7 mm to 1.7 m
(D) 17 cm to 170 m

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81. When the frequency of a source is doubled, its time period:

(A) becomes four times
(B) remains unchanged
(C) doubles
(D) becomes half

82. When the amplitude of a sound wave is doubled:

(A) its frequency doubles
(B) its wavelength doubles
(C) its loudness increases
(D) its speed doubles

83. In the same medium, the wavelength of ultrasonic waves is ____ that of audible sound.

(A) unrelated to
(B) longer than
(C) shorter than
(D) equal to

84. An echo is heard 0.4 s after a shout. If the speed of sound is 340 m/s, the reflecting surface is at:

(A) 136 m
(B) 34 m
(C) 68 m
(D) 17 m

85. A wall is 170 m away. If the speed of sound is 340 m/s, the echo of a clap is heard after:

(A) 0.1 s
(B) 1 s
(C) 0.5 s
(D) 2 s

86. A clear echo requires the reflecting surface to be:

(A) thin and porous
(B) small and soft
(C) large and hard
(D) wet and rough

87. Reverberation in a hall is reduced by the audience because they:

(A) amplify the sound
(B) produce an echo
(C) absorb sound
(D) reflect all the sound

88. An empty room sounds 'echoey' because:

(A) bare walls reflect sound with very little absorption
(B) air in an empty room is denser
(C) sound travels faster in empty rooms
(D) the walls are thicker

89. A whispering gallery works because of:

(A) repeated reflection of sound along a curved wall
(B) the Doppler effect
(C) refraction of sound
(D) absorption of sound

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90. A gun is fired and its echo is heard after 2.5 s. If the speed of sound is 340 m/s, the reflecting surface is at:

(A) 212.5 m
(B) 850 m
(C) 170 m
(D) 425 m

91. A submarine's SONAR detects an echo after 1 s. If the speed of sound in water is 1500 m/s, the object is at:

(A) 375 m
(B) 3000 m
(C) 750 m
(D) 1500 m

92. Which type of wave is used to detect hidden cracks in the body of an aeroplane?

(A) Audible sound of 100 Hz
(B) Ultrasonic waves
(C) Infrasonic waves
(D) Radio waves of 1 Hz

93. Ultrasound used in medicine has a frequency above:

(A) 20,000 Hz
(B) 20 Hz
(C) 200 Hz
(D) 2 Hz

94. Which of the following animals communicates using infrasound?

(A) House fly
(B) Elephant
(C) Cricket
(D) Bat

95. A hearing aid contains:

(A) a battery only
(B) a lens and a screen
(C) a prism and a mirror
(D) a microphone, an amplifier and a loudspeaker

96. SONAR can be used to detect:

(A) stars
(B) clouds
(C) aircraft
(D) shoals of fish

97. Parking sensors in cars work by:

(A) measuring temperature
(B) measuring the time taken by echoes from obstacles
(C) taking photographs
(D) detecting magnets

98. Information travels through an optical fibre in the form of:

(A) infrasound
(B) light waves
(C) sound waves
(D) water waves

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99. Ultrasound is used for flaw detection in industry because:

(A) it needs no medium
(B) it is louder than audible sound
(C) its short wavelength allows small flaws to be detected
(D) it travels faster than light

100. The speed of ultrasound in a given medium compared with that of audible sound is:

(A) smaller
(B) greater
(C) zero
(D) the same

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Answer Key

Q.	Ans	Q.	Ans	Q.	Ans	Q.	Ans	Q.	Ans
1	D	21	A	41	B	61	C	81	D
2	C	22	B	42	D	62	A	82	C
3	C	23	C	43	D	63	D	83	C
4	C	24	D	44	B	64	A	84	C
5	D	25	D	45	A	65	A	85	B
6	A	26	D	46	B	66	B	86	C
7	B	27	B	47	A	67	D	87	C
8	D	28	D	48	C	68	B	88	A
9	C	29	A	49	D	69	D	89	A
10	A	30	D	50	A	70	A	90	D
11	C	31	C	51	C	71	A	91	C
12	B	32	C	52	C	72	C	92	B
13	D	33	B	53	A	73	A	93	A
14	C	34	C	54	A	74	D	94	B
15	C	35	A	55	B	75	D	95	D
16	B	36	D	56	D	76	A	96	D
17	A	37	A	57	B	77	A	97	B
18	B	38	D	58	A	78	B	98	B
19	C	39	B	59	B	79	B	99	C
20	A	40	D	60	B	80	B	100	D

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