

ScholarEye

Physics MCQ Compendium | Grades 9 – 12

◆ 100 Solved Questions ◆ Correct Answers Highlighted ◆ All Topics Covered ◆

100
Questions

4
Grade Levels

20+
Topics

✓
Solved

◆ Class 9 — Physics

● Physical Quantities & Measurement

1. The SI unit of length is:

A) Centimetre

✓ B) Metre

C) Kilometre

D) Millimetre

● Physical Quantities & Measurement

2. Which of the following is a base quantity?

A) Speed

B) Force

✓ C) Mass

D) Pressure

● Physical Quantities & Measurement

3. Least count of a vernier caliper is:

A) 0.1 mm

✓ B) 0.01 mm

C) 1 mm

D) 0.001 mm

● Physical Quantities & Measurement

4. Scientific notation of 0.00045 is:

A) 4.5×10^{-3}

✓ B) 4.5×10^{-4}

C) 45×10^{-5}

D) 4.5×10^4

● Kinematics

5. A body moving with uniform velocity has acceleration equal to:

A) Maximum

B) Minimum

✓ C) Zero

D) Negative

● Kinematics

6. The slope of a distance-time graph gives:

A) Acceleration

✓ B) Speed

C) Displacement

D) Force

● Kinematics

7. Area under a speed-time graph represents:

- A) Speed
- B) Acceleration

✓ C) Distance covered

- D) Force

● Kinematics

8. A car starts from rest and reaches 20 m/s in 4 s. Its acceleration is:

- A) 4 m/s^2

✓ B) 5 m/s^2

- C) 80 m/s^2
- D) 2 m/s^2

● Dynamics

9. Newton's First Law of Motion is also called the law of:

- A) Acceleration

✓ B) Inertia

- C) Action-Reaction
- D) Momentum

● Dynamics

10. The SI unit of force is:

- A) Joule
- B) Watt

✓ C) Newton

- D) Pascal

● Dynamics

11. If mass = 5 kg and acceleration = 3 m/s^2 , then force is:

- A) 8 N
- B) 1.67 N

✓ C) 15 N

- D) 0.6 N

● Dynamics

12. Momentum is a _____ quantity:

- A) Scalar

✓ B) Vector

- C) Derived
- D) Both A and B

● Turning Effect of Forces

13. Torque is the product of force and:

- A) Velocity
- B) Mass

✓ C) Perpendicular distance

- D) Time

● Turning Effect of Forces

14. A body is in equilibrium when the net torque acting on it is:

- A) Maximum

✓ B) Zero

- C) Minimum
- D) Constant

● Gravitation

15. The value of gravitational acceleration 'g' on Earth is approximately:

A) 8.9 m/s^2

✓ B) 9.8 m/s^2

C) 10.8 m/s^2

D) 6.7 m/s^2

● Gravitation

16. Weight of a body is defined as:

A) Mass $\times$ Volume

B) Mass $\times$ Velocity

✓ C) Mass $\times$ g

D) Mass $\times$ Density

● Gravitation

17. The gravitational force between two bodies is directly proportional to the:

A) Sum of their masses

✓ B) Product of their masses

C) Difference of their masses

D) Square of sum of masses

● Work, Energy & Power

18. Work is done only when:

A) Force is applied

✓ B) Body moves in direction of force

C) Energy is produced

D) Velocity increases

● Work, Energy & Power

19. The SI unit of energy is:

A) Watt

B) Newton

✓ C) Joule

D) Pascal

● Work, Energy & Power

20. Power is defined as:

A) Work $\times$ Time

✓ B) Work / Time

C) Force $\times$ Distance

D) Energy $\times$ Time

● Properties of Matter

21. Density is defined as:

A) Mass $\times$ Volume

✓ B) Mass / Volume

C) Volume / Mass

D) Weight / Area

● Properties of Matter

22. Pressure is defined as force per unit:

A) Volume

B) Mass

✓ C) Area

D) Length

● *Properties of Matter*

23. Archimedes' principle is related to:

A) Gravity

✓ B) Buoyancy

C) Friction

D) Tension

● *Thermal Properties*

24. The thermometer works on the principle of:

✓ A) Thermal expansion

B) Gravity

C) Pressure

D) Density

● *Thermal Properties*

25. The boiling point of water on Celsius scale is:

A) 0°C

B) 37°C

✓ C) 100°C

D) 212°C

◆ Class 10 — Physics

● *Simple Harmonic Motion*

26. The time period of a simple pendulum depends on:

A) Mass of bob

B) Amplitude

✓ C) Length of pendulum

D) Shape of bob

● *Simple Harmonic Motion*

27. In SHM, the restoring force is proportional to:

A) Velocity

✓ B) Displacement

C) Acceleration

D) Time

● Waves

28. The distance between two consecutive crests is called:

- A) Amplitude
- B) Frequency

✓ C) Wavelength

- D) Period

● Waves

29. Speed of sound in air at 0°C is approximately:

- A) 232 m/s

✓ B) 332 m/s

- C) 432 m/s
- D) 532 m/s

● Waves

30. Frequency and time period are related as:

- A) $f = T$

✓ B) $f = 1/T$

- C) $f = T^2$
- D) $f = 2T$

● Sound

31. Echo is produced due to:

- A) Refraction
- B) Diffraction

✓ C) Reflection of sound

- D) Absorption of sound

● Sound

32. The frequency range of audible sound for humans is:

- A) 0–20 Hz

✓ B) 20–20,000 Hz

- C) 20,000–40,000 Hz
- D) 100–1000 Hz

● Geometrical Optics

33. A concave mirror is used as a:

- A) Rear-view mirror
- B) Shaving mirror
- C) Street light reflector

✓ D) Both B and C

● Geometrical Optics

34. The speed of light in vacuum is:

- A) 3×10^6 m/s

✓ B) 3×10^8 m/s

- C) 3×10^{10} m/s
- D) 3×10^4 m/s

● Geometrical Optics

35. Total internal reflection occurs when light travels from:

- A) Rare to dense medium

✓ B) Dense to rare medium

- C) Air to water
- D) Vacuum to glass

● *Electrostatics*

36. Like charges:

A) Attract each other

✓ B) Repel each other

C) Have no effect

D) Neutralize each other

● *Electrostatics*

37. The SI unit of electric charge is:

A) Ampere

B) Volt

✓ C) Coulomb

D) Ohm

● *Current Electricity*

38. Ohm's Law states that V is proportional to:

A) R

✓ B) I

C) P

D) Q

● *Current Electricity*

39. The SI unit of resistance is:

A) Ampere

B) Volt

C) Watt

✓ D) Ohm

● *Current Electricity*

40. In a series circuit, the current through each component is:

A) Different

✓ B) Same

C) Zero

D) Alternating

● *Magnetism*

41. A magnetic field is produced by:

A) Static charges

✓ B) Moving charges

C) Neutral particles

D) Photons

● *Magnetism*

42. The SI unit of magnetic flux density is:

A) Weber

✓ B) Tesla

C) Gauss

D) Henry

● *Electromagnetism*

43. Electromagnetic induction was discovered by:

A) Newton

B) Einstein

✓ C) Faraday

D) Maxwell

● *Electromagnetism*

44. A transformer works on the principle of:

✓ A) Mutual induction

B) Self-induction

C) Electric potential

D) Resistance

● *Basic Electronics*

45. A diode allows current to flow in:

A) Both directions

✓ B) One direction only

C) No direction

D) All directions

● *Basic Electronics*

46. An AND gate gives output 1 only when:

A) Both inputs are 0

B) One input is 1

✓ C) Both inputs are 1

D) One input is 0

● *Information Technology*

47. Radio waves have wavelength:

A) Less than visible light

✓ B) Greater than visible light

C) Equal to visible light

D) None of above

● *Nuclear Physics*

48. Alpha particles are identical to:

✓ A) Helium nuclei

B) Hydrogen nuclei

C) Electrons

D) Photons

● *Nuclear Physics*

49. The process of splitting a heavy nucleus is called:

A) Fusion

✓ B) Fission

C) Radioactivity

D) Decay

● *Nuclear Physics*

50. The unit of radioactivity is:

A) Joule

B) Watt

✓ C) Becquerel

D) Pascal

◆ Class 11 — Physics

● Vectors & Scalars

51. The resultant of two vectors of equal magnitude at 90° to each other is:

✓ A) $\sqrt{2}$ times each

- B) 2 times each
- C) Same as each
- D) Zero

● Vectors & Scalars

52. A scalar quantity has:

- A) Magnitude and direction
- ✓ B) Only magnitude
- C) Only direction
- D) Neither

● Motion in 2D

53. The horizontal range of a projectile is maximum at an angle of:

A) 30°

✓ B) 45°

- C) 60°
- D) 90°

● Motion in 2D

54. At the highest point of projectile motion, vertical velocity is:

- A) Maximum
- B) Equal to horizontal
- ✓ C) Zero
- D) Negative

● Laws of Motion

55. The rate of change of momentum is equal to:

A) Work done

✓ B) Applied force

- C) Kinetic energy
- D) Power

● Laws of Motion

56. In an elastic collision, which quantity is conserved?

- A) Momentum only
- B) KE only
- ✓ C) Both momentum and KE
- D) Neither

● Circular Motion

57. Centripetal acceleration is directed:

A) Away from centre

✓ B) Towards the centre

- C) Tangentially
- D) Vertically

● Circular Motion

58. The centripetal force formula is:

A) mv/r

✓ B) mv^2/r

- C) m^2v/r
- D) mv^2r

● Gravitation

59. Orbital speed of a satellite depends on:

A) Mass of satellite

✓ B) Height above Earth

C) Shape of orbit

D) All of the above

● Gravitation

60. Escape velocity from Earth's surface is approximately:

A) 7.9 km/s

B) 9.8 km/s

✓ C) 11.2 km/s

D) 3×10^5 km/s

● Fluid Mechanics

61. Bernoulli's principle is based on conservation of:

A) Mass

B) Momentum

✓ C) Energy

D) Charge

● Fluid Mechanics

62. Viscosity is a property of:

A) Solids only

✓ B) Fluids (liquids and gases)

C) Gases only

D) Plasma only

● Thermodynamics

63. First Law of Thermodynamics is a statement of conservation of:

A) Momentum

B) Charge

✓ C) Energy

D) Mass

● Thermodynamics

64. In an adiabatic process:

A) Temperature is constant

B) Pressure is constant

✓ C) No heat exchange

D) Volume is constant

● Waves

65. Stationary waves are formed by superposition of two waves travelling in:

A) Same direction

✓ B) Opposite directions

C) Perpendicular directions

D) Random directions

● Waves

66. The phenomenon of bending of light around obstacles is called:

A) Reflection

B) Refraction

✓ C) Diffraction

D) Interference

● Optics

67. A convex lens converges light rays at a point called:

A) Optical centre

✓ B) Principal focus

C) Centre of curvature

D) Focal plane

● Optics

68. The refractive index of a medium is defined as the ratio of speed of light in vacuum to speed in the medium. For glass (~1.5), the speed of light in glass is:

A) 4.5×10^8 m/s

✓ B) 2×10^8 m/s

C) 3×10^8 m/s

D) 1.5×10^8 m/s

● Electrostatics

69. Electric potential energy is stored in:

A) Moving charges

✓ B) Electric field

C) Magnetic field

D) Gravitational field

● Electrostatics

70. Capacitance of a capacitor is measured in:

A) Volt

B) Coulomb

✓ C) Farad

D) Henry

● Current Electricity

71. EMF of a cell is measured when:

A) Current is maximum

✓ B) No current flows

C) Resistance is zero

D) Cell is short-circuited

● Current Electricity

72. Kirchhoff's current law is based on conservation of:

A) Energy

B) Mass

✓ C) Charge

D) Momentum

● Magnetism

73. Magnetic field lines emerge from the:

A) South pole

✓ B) North pole

C) Centre of magnet

D) Along the magnet

● Electromagnetism

74. Lenz's law is related to:

✓ A) Direction of induced EMF

B) Magnitude of induced EMF

C) Speed of waves

D) Electric field

● Modern Physics Intro

75. The photoelectric effect was explained by:

- A) Newton
- B) Faraday

✓ C) Einstein

- D) Bohr

◆ Class 12 — Physics

● Electrostatics

76. Gauss's Law relates electric flux to:

- A) Surface area

✓ B) Enclosed charge

- C) Potential difference
- D) Current

● Electrostatics

77. The electric field inside a hollow conductor is:

- A) Maximum
- B) Minimum

✓ C) Zero

- D) Constant but non-zero

● Current & Circuits

78. In a Wheatstone bridge, when the bridge is balanced:

✓ A) Current through galvanometer is zero

- B) Maximum current flows
- C) Resistance is zero
- D) Voltage is maximum

● Current & Circuits

79. The time constant of an RC circuit is:

- A) R/C
- B) C/R

✓ C) RC

- D) $1/RC$

● Magnetic Effects

80. The force on a current-carrying conductor in a magnetic field is given by:

A) $F = qvB$

✓ B) $F = BIL$

C) $F = qE$

D) $F = mv^2/r$

● Magnetic Effects

81. The principle of a galvanometer is based on:

A) Electromagnetic induction

✓ B) Torque on current-carrying coil in B field

C) Lenz's law

D) Faraday's law

● AC Circuits

82. In a pure capacitive AC circuit, current leads voltage by:

A) 45°

✓ B) 90°

C) 180°

D) 0°

● AC Circuits

83. At resonance in an LCR series circuit:

A) Impedance is maximum

B) Current is minimum

✓ C) Impedance is minimum

D) Voltage is zero

● Electromagnetic Waves

84. Electromagnetic waves are produced by:

A) Stationary charges

✓ B) Accelerating charges

C) Constant velocity charges

D) Neutral particles

● Electromagnetic Waves

85. Which EM waves have the shortest wavelength?

A) Radio waves

B) Microwaves

C) X-rays

✓ D) Gamma rays

● Wave Optics

86. In Young's double slit experiment, fringe width is:

A) Directly proportional to slit separation

✓ B) Inversely proportional to slit separation

C) Independent of wavelength

D) Independent of screen distance

● Wave Optics

87. Polarization of light proves that light is a:

A) Longitudinal wave

✓ B) Transverse wave

C) Mechanical wave

D) Sound wave

● Modern Physics

88. de Broglie wavelength of a particle is given by:

A) $\lambda = mv/h$

✓ B) $\lambda = h/mv$

C) $\lambda = hm/v$

D) $\lambda = hv/m$

● Modern Physics

89. The work function in the photoelectric effect represents:

A) Maximum KE of emitted electrons

✓ B) Minimum energy to eject an electron

C) Energy of photon

D) Frequency of light

● Atomic Physics

90. According to Bohr's model, electrons revolve in orbits where angular momentum is:

A) Any value

B) nh/π

✓ C) $nh/2\pi$

D) Zero

● Atomic Physics

91. The energy of a photon is given by:

A) $E = h\lambda$

B) $E = h/f$

✓ C) $E = hf$

D) $E = mc^2$

● Nuclear Physics

92. The nucleus of an atom consists of:

A) Protons and electrons

✓ B) Protons and neutrons

C) Neutrons and electrons

D) Only protons

● Nuclear Physics

93. Nuclear fission releases energy because of:

A) Mass excess

B) Mass defect

C) Binding energy release

✓ D) Both B and C

● Nuclear Physics

94. The half-life of a radioactive substance is the time in which its activity reduces to:

A) One-quarter

B) One-third

✓ C) Half

D) Zero

● Semiconductor Physics

95. In an n-type semiconductor, the majority carriers are:

A) Holes

B) Protons

✓ C) Electrons

D) Neutrons

● Semiconductor Physics

96. A p-n junction diode in forward bias:

A) Blocks current

✓ B) Allows current to flow

C) Acts as an insulator

D) Increases resistance

● Semiconductor Physics

97. A transistor can be used as:

A) Amplifier only

B) Switch only

✓ C) Both amplifier and switch

D) Capacitor

● Communication Systems

98. Modulation is the process of:

A) Filtering the signal

✓ B) Mixing information signal with carrier wave

C) Amplifying the signal

D) Digitizing the signal

● Communication Systems

99. Optical fibres work on the principle of:

A) Diffraction

B) Interference

✓ C) Total internal reflection

D) Refraction

● Relativity & Modern Physics

100. According to Einstein's mass-energy equivalence:

A) $E = mc$

B) $E = m^2c$

✓ C) $E = mc^2$

D) $E = m/c^2$