100 Important Physics Questions for Competitive Exams

NEET | JEE | SSC | NDA | Railway | 2027

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Section A: Mechanics

Questions 1 – 20

01 **What is the SI unit of force?**
Answer: Newton (N)

02 **What is the acceleration due to gravity on Earth?**
Answer: 9.8 m/s² (approximately)

03 **What is the unit of work?**
Answer: Joule (J)

04 **What is momentum?**
Answer: Momentum = mass × velocity (p = mv)

05 **What is the SI unit of power?**
Answer: Watt (W)

06 **What is inertia?**
Answer: The tendency of an object to resist a change in its state of rest or motion

07 **What is velocity?**
Answer: Speed in a given direction (rate of change of displacement)

08 **What is the formula of kinetic energy?**
Answer: KE = ½mv²

09 **What is potential energy?**
Answer: Energy possessed by a body due to its position or configuration

10 **What is the unit of pressure?**
Answer: Pascal (Pa) = N/m^2

11 **What is Newton's first law?**
Answer: Law of inertia: a body stays at rest or in uniform motion unless an external force acts on it

12 **What is impulse?**
Answer: Impulse = force × time (equal to the change in momentum)

13 **What is uniform motion?**
Answer: Equal distances covered in equal intervals of time

14 **What is non-uniform motion?**
Answer: Unequal distances covered in equal intervals of time

15 **What is speed?**
Answer: Speed = distance/time

16 **What is displacement?**
Answer: Shortest distance between the initial and final positions, with direction (a vector)

17 **What is the formula of work?**
Answer: $W = F \times d \times \cos\theta$
(When force and displacement are in the same direction, $W = F \times d$.)

18 **What is energy?**
Answer: Capacity to do work

19 **What is mass?**
Answer: Quantity of matter in a body (SI unit: kg)

20 **What is friction?**
Answer: Force that opposes the relative motion between two surfaces in contact

Section B: Electricity
Questions 21 – 40

21 **What is Ohm's law?**
Answer: $V = IR$
(V = voltage, I = current, R = resistance)

22 **What is the SI unit of current?**
Answer: Ampere (A)

23 **What is resistance?**
Answer: Opposition to the flow of current

24 **What is voltage?**
Answer: Potential difference between two points

25 **What is the unit of resistance?**
Answer: Ohm (Ω)

26 **What is electric power?**
Answer: P = VI

27 **What is a conductor?**
Answer: A material that allows current to pass through it

28 **What is an insulator?**
Answer: A material that does not allow current to pass through it

29 **What is the unit of electric charge?**
Answer: Coulomb (C)

30 **What is a series circuit?**
Answer: A circuit in which the same current flows through all components

31 **What is a parallel circuit?**
Answer: A circuit in which the same voltage is across all branches

32 **What is a fuse?**
Answer: A safety device that melts and breaks the circuit when the current becomes too high

33 **What is a battery?**
Answer: A source of electrical energy

34 **What is capacitance?**
Answer: The ability to store charge (C = Q/V). Its unit is the farad (F).

35 **What is an electric field?**
Answer: Force per unit charge (unit: N/C)

36 **What is the formula for current?**
Answer: I = Q/t
(Q = charge, t = time)

37 **What is EMF?**
Answer: Energy supplied per unit charge by a source (unit: volt)

38 **What is a resistor?**
Answer: A device that limits the flow of current

39 **What is a short circuit?**
Answer: A very low-resistance path between two points, causing a very large current

40 **Which unit of electrical energy is used for electricity bills?**
Answer: Kilowatt-hour (kWh), where 1 kWh = 3.6×10^6 J

Section C: Modern Physics

Questions 41 – 60

41 **Who discovered the electron?**
Answer: J.J. Thomson

42 **What is the photoelectric effect?**
Answer: Emission of electrons from a metal surface when light of suitable frequency falls on it

43 **Who proposed the atomic model with quantised electron orbits?**
Answer: Niels Bohr

44 **What is a nucleus?**
Answer: The central, positively charged part of an atom, containing protons and neutrons

45 **What is the charge of a proton?**
Answer: Positive ($+1.6 \times 10^{-19}$ C)

46 **What is the charge of a neutron?**
Answer: Neutral (no charge)

47 **What is the charge of an electron?**
Answer: Negative (-1.6×10^{-19} C)

48 **What is radioactivity?**
Answer: Spontaneous emission of radiation from unstable nuclei

49 **What is an isotope?**
Answer: Atoms of the same element (same atomic number) with different mass numbers

50 **What is half-life?**
Answer: Time required for half of the radioactive nuclei to decay

51 **What is nuclear fission?**
Answer: Splitting of a heavy nucleus into lighter nuclei

52 **What is nuclear fusion?**
Answer: Combining of light nuclei to form a heavier nucleus

53 **What is a photon?**
Answer: A particle (quantum) of light, with energy $E = h\nu$

54 **What is the value of Planck's constant?**
Answer: 6.626×10^{-34} J·s

55 **What are X-rays?**
Answer: High-energy electromagnetic radiation (discovered by Röntgen)

56 **What are gamma rays?**
Answer: Very high-energy electromagnetic radiation from the nucleus, with the shortest wavelength in the EM spectrum

57 **What is an alpha particle?**
Answer: A helium nucleus (2 protons + 2 neutrons)

58 **What is a beta particle?**
Answer: A high-speed electron (β^-) or positron (β^+) emitted from the nucleus

59 **What is quantum theory?**
Answer: Energy is emitted or absorbed in discrete packets called quanta

60 **What is Einstein's mass-energy relation?**
Answer: $E = mc^2$

Section D: NEET & JEE Questions

Questions 61 – 100

D1. Quick Revision (61 – 77)

61 **A body moves with constant velocity. What is its acceleration?**
Answer: Zero

62 **What is Newton's second law?**
Answer: $F = ma$
(F = force, m = mass, a = acceleration)

63 **What is the force on a 2 kg mass with 3 m/s² acceleration?**
Answer: $F = ma = 2 \times 3 = 6$ N

64 **What is the momentum of a 5 kg body moving at 2 m/s?**
Answer: $p = mv = 5 \times 2 = 10$ kg·m/s

65 **What is the kinetic energy of a 2 kg body moving at 3 m/s?**
Answer: $KE = \frac{1}{2}mv^2 = \frac{1}{2} \times 2 \times 3^2 = 9$ J

66 **What is the formula for potential energy?**
Answer: $PE = mgh$
(m = mass, g = acceleration due to gravity, h = height above the ground)

67 **What is the formula for acceleration?**
Answer: $a = (v - u)/t$
(u = initial velocity, v = final velocity, t = time)

68 **What is the work-energy theorem?**
Answer: Net work done = change in kinetic energy

69 **What is the wave speed formula?**
Answer: $v = f\lambda$
(f = frequency, λ = wavelength)

70 **What is the speed of sound in air?**
Answer: About 343 m/s (at 20°C)

71 **What is the speed of light in vacuum?**
Answer: 3×10^8 m/s

72 **What is the energy of a photon?**
Answer: $E = h\nu$
(h = Planck's constant = 6.626×10^{-34} J·s, ν = frequency of radiation)

73 **What is the unit of magnetic field?**
Answer: Tesla (T)

74 **What is the lens formula?**
Answer: $1/f = 1/v - 1/u$
(Use the sign convention carefully.)

75 **What is the mirror formula?**
Answer: $1/f = 1/v + 1/u$

76 **What is the formula for heat?**
Answer: $Q = mc\Delta T$
(m = mass, c = specific heat capacity, ΔT = change in temperature)

77 **What is the law of conservation of energy?**
Answer: Energy can neither be created nor destroyed, only converted from one form to another.

D2. MCQs (78 – 92)

78 **A ball is thrown vertically upward. At the highest point, its velocity and acceleration are:**

(a) 0 and 0
(b) 0 and 9.8 m/s² downward
(c) 9.8 m/s and 0
(d) 9.8 m/s upward and 9.8 m/s² downward

Answer: (b). Velocity becomes zero for a moment, but gravity keeps acting.

79 **Which of the following is NOT a vector quantity?**

(a) Displacement
(b) Velocity
(c) Force
(d) Speed

Answer: (d). Speed has magnitude only.

80 **If the velocity of a body is doubled, its kinetic energy becomes:**

(a) 2 times
(b) 4 times
(c) Half
(d) Same

Answer: (b). $KE \propto v^2$.

81 **The dimensional formula of work is:**

(a) MLT^{-2} **(b)** ML^2T^{-2}
(c) ML^2T^{-3} **(d)** MLT^{-1}

Answer: (b). Work = force × distance = $(MLT^{-2}) \times L = ML^2T^{-2}$.

82 **The time period of a simple pendulum depends on:**

(a) Mass of the bob and length **(b)** Length and acceleration due to gravity
(c) Mass of the bob only **(d)** Amplitude only

Answer: (b). $T = 2\pi\sqrt{(l/g)}$. Mass doesn't matter.

83 **The escape velocity from the Earth's surface is approximately:**

(a) 7.9 km/s **(b)** 9.8 km/s
(c) 11.2 km/s **(d)** 15 km/s

Answer: (c). Escape velocity = 11.2 km/s (7.9 km/s is the orbital velocity near the surface).

84 **Two resistors of 4 Ω each are connected in parallel. The equivalent resistance is:**

(a) 8 Ω **(b)** 4 Ω
(c) 2 Ω **(d)** 1 Ω

Answer: (c). $1/R = 1/4 + 1/4 = 1/2$, so $R = 2\ \Omega$.

85 **The SI unit of magnetic flux is:**

(a) Tesla **(b)** Weber
(c) Henry **(d)** Gauss

Answer: (b). Weber (Wb). Tesla is the unit of magnetic field.

86 **Energy stored in a 2 μF capacitor charged to 10 V is:**

(a) 1×10^{-4} J **(b)** 2×10^{-4} J
(c) 1×10^{-5} J **(d)** 2×10^{-5} J

Answer: (a). $U = \frac{1}{2}CV^2 = \frac{1}{2} \times 2 \times 10^{-6} \times 100 = 1 \times 10^{-4}$ J.

87 **A convex lens has a focal length of 50 cm. Its power is:**

(a) +0.5 D **(b)** +2 D
(c) −2 D **(d)** +5 D

Answer: (b). P = 1/f (in metres) = 1/0.5 = +2 D.

88 **The photoelectric effect supports which nature of light?**

(a) Wave nature **(b)** Particle nature
(c) Both equally **(d)** Neither

Answer: (b). Light behaves as photons here.

89 **A radioactive sample of 80 g has a half-life of 10 days. How much remains after 30 days?**

(a) 40 g **(b)** 20 g
(c) 10 g **(d)** 5 g

Answer: (c). 30 days = 3 half-lives, so 80 → 40 → 20 → 10 g.

90 **Which mode of heat transfer does NOT need a medium?**

(a) Conduction **(b)** Convection
(c) Radiation **(d)** All of these

Answer: (c). Radiation can travel through vacuum.

91 **Lenz's law is a consequence of the conservation of:**

(a) Charge **(b)** Momentum
(c) Energy **(d)** Mass

Answer: (c). The induced current opposes the change, which is energy conservation at work.

92 **Which of these is dimensionless?**

(a) Refractive index **(b)** Pressure
(c) Frequency **(d)** Density

Answer: (a). Refractive index is a ratio of two speeds.

D3. Numericals (93 – 100)

93 **A car starts from rest and accelerates at 2 m/s² for 5 seconds. Find its final velocity and the distance covered.**

Answer: $v = u + at = 0 + 2 \times 5 =$ **10 m/s**. $s = \frac{1}{2}at^2 = \frac{1}{2} \times 2 \times 25 =$ **25 m**.

94 **A ball is dropped from a height of 20 m. How long does it take to reach the ground, and with what speed does it hit? (g = 10 m/s²)**

Answer: $t = \sqrt{(2h/g)} = \sqrt{(40/10)} =$ **2 s**. $v = gt =$ **20 m/s**.

95 **How much work is done in lifting a 5 kg block through 4 m? (g = 10 m/s²)**

Answer: $W = mgh = 5 \times 10 \times 4 =$ **200 J**.

96 **A 10 Ω resistor is connected across a 20 V battery. Find the current and the power consumed.**

Answer: $I = V/R =$ **2 A**. $P = VI = 20 \times 2 =$ **40 W**.

97 **How much heat is needed to raise the temperature of 2 kg of water by 10°C? (c = 4200 J/kg·°C)**

Answer: $Q = mc\Delta T = 2 \times 4200 \times 10 =$ **84,000 J**.

98 **A wave has a frequency of 500 Hz and a wavelength of 0.68 m. Find its speed.**

Answer: $v = f\lambda = 500 \times 0.68 =$ **340 m/s**.

99 **An object is placed 30 cm in front of a convex lens of focal length 10 cm. Find the image distance.**

Answer: Taking $u = -30$ cm and $f = +10$ cm: $1/v = 1/f + 1/u = 1/10 - 1/30 = 2/30$, so $v =$ **+15 cm** (real image).

100 **A constant force of 10 N acts on a 2 kg body (initially at rest) for 3 seconds. Find the impulse and the final velocity.**

Answer: Impulse $= F \times t =$ **30 N·s**. $v =$ impulse/$m = 30/2 =$ **15 m/s**.