Yakeen NEET 2.0 (2026)

Physics by Saleem Sir

KPP - Formula

Unit and Dimensions

Dimensions of Quantites Related to Mechanics:

S.N.	Quantity	Formula	Unit	Dimension
1.	Velocity or speed (v)	$v = \frac{d}{t} = \frac{\text{Displacement or Distance}}{\text{Time}}$	m/s	$[M^0L^1T^{-1}]$
2.	Acceleration (a)	$a = \frac{\Delta v}{\Delta t} = \frac{\text{Change in velocity}}{\text{Change in time}}$	m/s^2	$[M^0LT^{-2}]$
3.	Momentum (P)	$P = mv = \text{Mass} \times \text{Velocity}$	$\text{kg} - \text{m/s}$	$[M^1L^1T^{-1}]$
4.	Impulse (I)	$I = F \times \Delta t = \text{Force} \times \text{Time}$	Newton-second or $\text{kg} - \text{m/s}$	$[M^1L^1T^{-1}]$
5.	Force (F)	$F = ma = \text{Mass} \times \text{Acceleration}$	Newton	$[M^1L^1T^{-2}]$
6.	Pressure (P)	$P = \frac{F}{A} = \frac{\text{Force}}{\text{Area}}$	Pascal	$[M^1L^{-1}T^{-2}]$
7.	Kinetic energy (E_K)	$K = \frac{1}{2}mv^2 = \frac{1}{2}\text{Mass} \times \text{Velocity}^2$	Joule	$[M^1L^2T^{-2}]$
8.	Power (P)	$P = \frac{W}{t} = \frac{\text{Work}}{\text{Time}}$	Watt or Joule/sec	$[M^1L^2T^{-3}]$
9.	Density (d)	$\rho = \frac{m}{V} = \frac{\text{Mass}}{\text{Volume}}$	kg/m^3	$[M^1L^{-3}T^0]$
10.	Angular displacement (θ)	$\theta = \frac{S}{r} = \frac{\text{Arc}}{\text{Length}}$	Radian (rad.)	$[\ M^0L^0T^0\ ]$
11.	Angular velocity (ω)	$\omega = \frac{\Delta\theta}{\Delta t} = \frac{\text{Angular displacement}}{\text{Time}}$	Radian/sec	$[M^0L^0T^{-1}]$
12.	Angular acceleration (α)	$\alpha = \frac{\Delta\omega}{\Delta t} = \frac{\text{Angular velocity}}{\text{Time}}$	Radian/sec^2	$[M^0L^0T^{-2}]$
13.	Moment of inertia (I)	$I = mx^2 = \text{Mass} \times \text{Distance}^2$	$\text{kg} - \text{m}^2$	$[M^1L^2T^0]$

14.	Torque (τ)	$\tau = F \times r_{\perp}$ = Force × Perpendicular distance	Newton-meter	$[M^1L^2T^{-2}]$
15.	Angular momentum (L)	$L = mvr$ = Mass × Velocity × Radius	Joule-sec	$[M^1L^2T^{-1}]$
16.	Force constant or spring constant (k)	$F = -kx$ = Force constant × Displacement	Newton/m	$[M^1L^0T^{-2}]$
17.	Gravitational constant (G)	$F = \frac{Gm_1m_2}{r^2}$ $= \frac{\text{Gravitational constant} \times \text{Mass}^{\,2}}{\text{Distance}^{\,2}}$	$N - m^2/k^2$	$[M^{-1}L^3T^{-2}]$
18.	Gas constant (R)	$PV = nRT$ Pressure × Velocity = Gas constant × Temperature	Joule/mol-K	$[M^1L^2T^{-2}\theta^{-1}]$
19.	Planck's constant (h)	$E = h\nu$ Energy = Planck's constant × Frequency	Joule-s	$[M^1L^2T^{-1}]$
20.	Surface tension (T)	$T = \frac{F}{l} \Rightarrow$ Surface Tension $= \frac{\text{Force}}{\text{Length}}$	N/m or joule/m^2	$[M^1L^0T^{-2}]$
21.	Coefficient of viscosity (η)	$\eta = \frac{F}{6\pi rv} = \frac{\text{Force}}{\text{Radius} \times \text{Velocity}}$	$\text{kg/m} - \text{s}$	$[M^1L^{-1}T^{-1}]$
22.	Time period (T)	$T = \frac{1}{n} = \frac{1}{\text{Frequency}}$	Second	$[M^0L^0T^1]$
23.	Frequency (n)	$n = \frac{1}{T} = \frac{1}{\text{Time}}$	Hz	$[M^0L^0T^{-1}]$

Dimensions of Quantities Related to Electricity and Heat:

S.N.	Quantity	Formula	Unit	Dimension
1.	Heat (Q)	Energy	Joule	$[ML^2\ T^{-2}]$
2.	Specific Heat (c)	$c = \frac{Q}{m \times \Delta\theta} = \frac{\text{Heat}}{\text{Mass} \times \text{Temperature}}$	Joule/kg-K	$[M^0\ L^2\ T^{-2}\ K^{-1}]$
3.	Thermal capacity (K)	$K = \frac{Q}{\Delta t} = \frac{\text{Heat}}{\text{Time}}$	Joule/K	$[M^1L^2T^{-2}K^{-1}]$
4.	Latent heat (L)	$L = \frac{Q}{m} = \frac{\text{Heat}}{\text{Mass}}$	Joule/kg	$[M^0L^2T^{-2}]$

5.	Boltzmann constant (k)	$k = \frac{E}{T} = \frac{\text{Energy}}{\text{Temperature}}$	Joule/K	$[M^1L^2T^{-2}K^{-1}]$
6.	Coefficient of thermal conductivity (k)	$k = \frac{Qd}{A \times \Delta\theta \times t} = \frac{\text{Heat} \times \text{Distance}}{\text{Area} \times \text{Temp. difference} \times \text{Time}}$	Joule/m-s-K	$[\mathrm{M^1\ L^1\ T^{-3}\ K^{-1}}]$
7.	Stefan's constant (σ)	$\sigma = \frac{\Delta E}{A \times \Delta t \times \theta^4} = \frac{\text{Energy}}{\text{Area} \times \text{Time} \times \text{Temperature}^4}$	Watt $/m^2 - K^4$	$[\mathrm{M^1\ L^0\ T^{-3}\ K^{-4}}]$
8.	Wien's constant (b)	$b = \lambda_{max} \times T = \text{Wavelength} \times \text{Temperature}$	Meter-K	$[\mathrm{M^0\ L^1\ T^0\ K^1}]$
9.	Coefficient of linear expansion (α)	$\alpha = \frac{\Delta L}{L}\frac{1}{T} = \frac{\text{Change in length}}{\text{Length} \times \text{Temperature}}$	Kelvin $^{-1}$	$[M^0L^0T^0K^{-1}]$
10.	Mechanical eq. of Heat (J)	$J = \frac{W}{Q} = \frac{\text{Work}}{\text{Heat}}$	Joule/Calorie	$[\ \mathrm{M^0L^0\ T^0}\ ]$
11.	Vander wall's constant (a)	$a = \frac{RTV^2}{V-b} - PV^2$	Newton-m^4	$[M^1L^5T^{-2}]$
12.	Vander wall's constant (b)	Same as Volume (V)	m^3	$[\ M^0L^3T^0\ ]$
13.	Temperature (T)	$T = \frac{Q}{M\Delta C}$	Kelvin (K)	$[\ M^0L^0T^0K^1\ ]$

Electricity and Magnetism:

S.N.	Quantity	Formula	Unit	Dimension
1.	Electric charge (q)	$q = I \times t = \text{Electric current} \times \text{Time}$	Coulomb	$[M^0L^0T^1A^1]$
2.	Electric current (I)	$i = \frac{q}{t} = \frac{\text{Charge}}{\text{Time}}$	Ampere	$[M^0L^0T^0A^1]$
3.	Capacitance (C)	$C = \frac{q}{V} = \frac{\text{Charge}}{\text{Voltage difference}}$	Coulomb/volt or Farad	$[M^{-1}L^{-2}T^4A^2]$
4.	Electric potential (V)	$V = \frac{q}{C} = \frac{\text{Charge}}{\text{Capacitance}}$	Joule/coulomb	$[M^1L^2T^{-3}A^{-1}]$

5.	Permittivity of free space (ε_0)	$\varepsilon_0 = \frac{\text{Fr}^2}{\text{m}^2} = \frac{\text{Charge}^2}{\text{Electric force} \times \text{Distance}^2}$	Coulomb^2/Newton-meter^2	$[M^{-1}L^{-3}T^4A^2]$
6.	Dielectric constant (K)	$K = \frac{\varepsilon}{\varepsilon_0} = \frac{\text{Permittivity in medium}}{\text{Permittivity in free space}}$	Unitless	$[M^0L^0T^0]$
7.	Resistance (R)	$R = \frac{V}{I} = \frac{\text{Voltage difference}}{\text{Electrict current}}$	Volt/Ampere or Ohm	$[M^1L^2T^{-3}A^{-2}]$
8.	Resistivity or Specific resistance (ρ)	$\rho = \frac{RA}{\ell} = \frac{\text{Resistance} \times \text{Area}}{\text{Length}}$	Ohm-meter	$[M^1L^3T^{-3}A^{-2}]$
9.	Coefficient of self-induction (L)	$L = \frac{\mu_0 N^2 A}{\ell}$	Volt-Second/Ampere or Henery or Ohm-second	$[M^1L^2T^{-2}A^{-2}]$
10.	Magnetic flux (ϕ)	$\phi = B \times A =$ Magnetic field $\times$ Area	Volt-second or Weber	$[M^1L^2T^{-2}A^{-1}]$
11.	Magnetic induction (B)	$B = \frac{F}{q \times v} = \frac{\text{Magnetic force}}{\text{Charge} \times \text{Velocity}}$	Newton/Ampere-Meter or Tesla	$[M^1L^0T^{-2}A^{-1}]$
12.	Magnetic intensity (H)	$H = \frac{B}{\mu} = \frac{\text{Magnetic field}}{\text{Permeability}}$	Ampere/meter	$[M^0L^{-1}T^0A^1]$
13.	Magnetic dipole moment (M)	$M = I \times A =$ Current $\times$ Area	Ampere-meter^2	$[M^0L^2T^0A^1]$
14.	Permeability of free space (μ_0)	$\mu_0 = \frac{B \cdot \ell}{I} = \frac{\text{Magnetic field} \times \text{Length}}{\text{Current}}$	Newton/Ampere^2	$[M^1L^1T^{-2}A^{-2}]$
15.	Surface charge density (σ)	$\sigma = \frac{q}{A} = \frac{\text{Charge}}{\text{Area}}$	Coulomb-meter^2	$[M^0L^{-2}T^1A^1]$
16.	Electric dipole moment (p)	$p = q \times d =$ Charge $\times$ Distance	Coulomb-meter	$[\ M^0L^1T^1A^1\ ]$

17.	Conductance (G)	$G = \frac{1}{R} = \frac{1}{\text{Resistance}}$	Ohm $^{-1}$	$[M^{-1}L^{-2}T^{3}A^{2}]$
18.	Conductivity (σ)	$\sigma = \frac{1}{\rho} = \frac{1}{\text{Resistivity}}$	Ohm^{-1} meter^{-1}	$[M^{-1}L^{-3}T^{3}A^{2}]$
19.	Current density (J)	$J = \frac{I}{A} = \frac{\text{Current}}{\text{Area}}$	Ampere/m^2	$[M^{0}L^{-2}T^{0}A^{1}]$
20.	Intensity of electric field (E)	$E = \frac{F}{q} = \frac{\text{Electric force}}{\text{Electric charge}}$	Volt/meter, Newton/coulomb	$[M^{1}L^{1}T^{-3}A^{-1}]$
21.	Rydberg constant (R)	$R_H = \frac{me^4}{8h^3c\varepsilon_0^2}$	m^{-1}	$[M^{0}L^{-1}T^{0}]$

Quantities Having Same Dimensions:

S.N.	Dimension	Quantity
1.	$[M^{0}L^{0}T^{-1}]$	Frequency, Angular frequency, Angular velocity and Velocity gradient
2.	$[M^{1}L^{2}T^{-2}]$	Work, Internal energy, Potential energy, Kinetic energy, Torque
3.	$[M^{1}L^{-1}T^{-2}]$	Pressure, Stress, Young's modulus, Bulk modulus, Modulus of rigidity, Energy density
4.	$[M^{1}L^{1}T^{-1}]$	Momentum, Impulse
5.	$[M^{1}L^{1}T^{-2}]$	Thrust, Force, Weight
6.	$[M^{1}L^{2}T^{-1}]$	Angular momentum and Planck's constant
7.	$[M^{1}L^{0}T^{-2}]$	Surface tension, Surface energy (energy per unit area), Force constant and Spring constant
8.	$[M^{0}L^{2}T^{-2}]$	Latent heat and Gravitational potential
9.	$[M^{1}L^{2}T^{-2}\theta^{-1}]$	Thermal capacity, Gas constant and Entropy
10.	$[M^{0}L^{0}T^{1}]$	$L/R, \sqrt{LC}, RC$ where L = Inductance, R = Resistance, C = Capacitance and time
11.	$[M^{0}L^{1}T^{0}]$	Distance, Displacement, Radius, Wavelength radius of gyration.

12.	$[M^0L^1T^{-1}]$	Speed, Velocity, Velocity of light.
13.	$[M^0L^1T^{-2}]$	Acceleration, Acceleration due to gravity, Centripetal acceleration.
14.	$[\ M^0L^0T^1\ ]$	Decay constant, Rate of disintegration.
15.	$[M^0L^2T^{-2}\theta^{-1}]$	Specific heat, Specific gas constant.
16.	$[M^0L^1T^0]$	Wave Number, Power of a lens, Rydberg's constant.
17.	$[M^1L^2T^{-3}A^{-1}]$	Electric Potential, emf (electromotive force).
18.	No Dimension $[M^0L^0T^0]$	Strain, Poisson's ratio, Refractive index, Dielectric constant, Coefficient of friction, Relative permeability, Magnetic susceptibility, Electric susceptibility, Angle, Solid angle, Trigonometric ratio's, Logarithm function & Exponential constant are all dimensionless.
19.	$[M^{-1}L^{-3}T^4A^2]$	Permittivity of free space, Permeability of free space.