It is a scalar quantity and the Dimension of work is $\left[M^1L^2T^{-2}\right]$, SI unit of Work is the joule (J) and $1J = 1N \cdot m = Kgm^2s^{-2}$

Kinetic Friction:

- $f_k = \mu_k \cdot N$
- Maximum Static Friction (Limiting Friction): $f_{\max} = \mu_s \cdot N$,
  Where, N = Normal Force,
  μ_k = Coefficient of Kinetic Friction,
  μ_s = Coefficient of Static Friction.

Simple Harmonic Motion:

- Force $(F) = -kx$ and $k = \omega^2 m$
  Where, k = Force Constant,
  m = Mass of the Particle,
  x = Displacement and ω^2 = Positive Constant.

Torque:
The torque or vector moment or moment vector (M) of a force (F) about a point (P) is defined as:

- $M = r \times F$
  Where, r is the vector from the point P to any point A on the line of action L of F.

These are few of the key formulas for JEE Advanced 2025 Physics. To gain confidence and perform well in the exam, it is important to grasp their applications and practice various types of questions based on them.

Important Chemistry Formulas for JEE Advanced 2025

Chemistry is considered as a simple subject in comparison. Maximum marks can be obtained from this section with proper preparation. Let us look at some crucial **list of formulas for JEE Advanced** 2025.

Ideal Gas Law:
$PV = nRT$

Kinetic Energy of Gas Molecules:
$KE = \left(\frac{3}{2}\right)RT$
$T(K) = T^\circ C + 273.15$

Molarity:

$$(M) = \frac{\text{No. of Moles of Solutes}}{\text{Volume of Solution in Liters}}$$

Unit: mole/L

Molality:

$$(m) = \frac{\text{No. of Moles of Solutes}}{\text{Mass of solvent in kg}}$$

Molecular Mass $= 2\times$ vapor density

Atomic number = No. of protons in the nucleus = No. of electrons in the nucleus

Mass number = No. of protons + No. of neutrons C $= v\lambda$

Boyle's Law:

$P_1V_1 = P_2V_2$ (at constant T and n)

Charles's Law:

$\frac{V_1}{T_1} = \frac{V_2}{T_2}$ (at constant P and n)

Avogadro's Law:

$\frac{V}{n}$ = constant, where V is the volume and n is the number of moles.

Dalton's Law of Partial Pressures:

$P(\text{total}) = P_1 + P_2 + P_3 + \ldots$, where P(total) is the total pressure and P_1, P_2, P_3 etc. are the partial pressures of individual gases in the mixture.

Enthalpy:

$H = U + pV$

First Law of Thermodynamics:

$\Delta U = q + W$

Ohm's Law:

$$V = RI$$

Faraday's Laws:

- Faraday's First Law of Electrolysis:
  $$M = Zit$$
  Z = Atomic Mass / n × F
- Faraday's Second Law of Electrolysis:
  $$\frac{M_1}{M_2} = \frac{E_1}{E_2}$$

Freundlich Adsorption Isotherm:

$$\left[\frac{x}{m}\right] - Kp^{\left(\frac{1}{n}\right)}; n \geq 1$$

Henry's Law:

$S = kH \times P$,
Where S is the solubility of a gas in a liquid, P is the partial pressure of the gas above the liquid, and kH is the Henry's law constant.

Nernst Equation:

$$E = E° - \left(\frac{RT}{nF}\right) lnQ,$$

Where E is the cell potential, $E°$ is the standard cell potential, R is the gas constant, T is the temperature, n is the number of electrons transferred, F is the Faraday constant, and Q is the reaction quotient.

Henderson-Hasselbalch Equation:

$$pH = pKa + log\left(\frac{[A^-]}{[HA]}\right)$$

Where pH is the negative logarithm of the hydrogen ion concentration, pKa is the acid dissociation constant, $[A^-]$ is the concentration of the conjugate base, and $[HA]$ is the concentration of the acid.

Beer-Lambert Law:

$$A = \epsilon bc$$

Where A is the absorbance, ϵ is the molar absorptivity, b is the path length, and c is the concentration.

Important Maths Formulas for JEE Advanced 2025