IMPORTANT JEE-NEET FORMULAS

Work, Power & Energy

Topics	Formulas
Work Done by Constant Force	$$W = \vec{F} \cdot \vec{S}$$ $$W = FS\cos\theta$$ Work is a scalar quantity.
Work done by Multiple Forces	$$W = [\sum \vec{F}.\vec{S}]$$ $$W = W_1 + W_2 + W_3 + W_4 + \ldots..$$ Work done on particle is the sum of individual work done by all the forces acting on the particles.
Dimensions of work	The dimensional formula for work is given as: $$work = [ML^2T^{-2}]$$
Kinetic Energy	Since mass is a positive quantity, so kinetic energy is also a positive quantity. $$K = \frac{1}{2}mv^2 = \frac{p^2}{2m}$$ p = linear momentum
Potential Energy	Potential Energy is given for conservative forces as $$F = -\frac{dU}{dx}$$
Gravitational Energy	Gravitational Energy is given as $$U_{gravitational} = mgh$$
Energy of spring	Energy of spring is given as $$U_{spring} = \frac{1}{2}kx^2$$
Work energy theorem	According to Work energy theorem, the change in kinetic energy of an object is the net work done by the net force on the object. Therefore, $$W = \Delta K$$ K = kinetic energy
Mechanical energy	Mechanical energy E of a body is the sum of kinetic energy K and potential energy U. When force is conservative in nature then mechanical energy is given as $$E = U + K$$
Average power	Average power is given as $$P_{av} = \frac{W}{t}$$