PHYSICS EQUATIONS – 1st SEMESTER

VELOCITY	velocity = final distance –initial distance / time	$v = \frac{\Delta d}{t}$
ACCELERATION	acceleration = final velocity – initial velocity / time	$a = \frac{V_f - V_i}{t}$
GRAVITATIONAL ACCELERATION	velocity = acceleration · time distance = ½ acceleration · time^2	$v_y = at$ $d_y = \frac{1}{2}at^2$
PYTHAGOREAN THEOREM	The square on the hypotenuse is equal to the sum of the squares on the other two sides.	$c^2 = a^2 + b^2$
NET FORCE	Net Force = mass · acceleration	$F_{Net} = ma$
WEIGHT	Weight = mass · acceleration due to gravity	$W = mg$
SLIDING FRICTION	friction force = coefficient of friction · normal force	$F_f = \mu F_n$
MOMENTUM	momentum = mass · velocity	$p = mv$
IMPULSE	Impulse = force · time = change in momentum	$J = Ft = m\Delta v = \Delta p$
CONSERVATION OF MOMENTUM	Sum momentum before = Sum momentum after $m_1v_1 + m_2v_2 = m_1v'_1 + m_2v'_2$ $m_1v_1 + m_2v_2 = (m_1 + m_2)\,v'$	$\Sigma p_{\text{before}} = \Sigma p_{\text{after}}$ Elastic collisions Inelastic collisions
WORK	Work = force · distance	$W = F \cdot d$
POWER	power = work / time	$P = \frac{W}{t}$
POTENTIAL ENERGY	potential energy = mass · gravity · height	P.E. = mgh
KINETIC ENERGY	kinetic energy = ½ mass · velocity^2	K.E. = ½mv^2
CONSERVATION OF MECHANICAL ENERGY	$\text{Energy}_{\text{before}} = \text{Energy}_{\text{after}}$ $\text{Kinetic Energy}_1 + \text{Potential Energy}_1 + \text{Work} = \text{Kinetic Energy}_2 + \text{Potential Energy}_2$	$\Sigma E_b = \Sigma E_a$ $KE_1 + PE_1 + W = KE_2 + PE_2$