Formula sheet

$v = u + at$ $\qquad S = ut + \frac{1}{2}at^2$ $\qquad v^2 = u^2 + 2as$

1 degrees $= \frac{2\pi}{360}$ radians $\qquad S = \theta \times r$ $\qquad V = \omega \times r$ $\qquad a = \alpha \times r$

Momentum=mv $\qquad$ Acceleration torque $= mk^2\alpha$ $\qquad$ $Torque = I\alpha$

CG for triangle=one third distance from the base

CG for rectangle=half way between top and bottom sides

CG for Trapezium $= \frac{h}{3}\left(\frac{b+2a}{b+a}\right)$ $\qquad$ C G for circle $= \frac{4r}{3\pi}$

CG for system of loads; $\quad \mathbf{X} = \sum \frac{\text{moments of areas}}{\text{areas}}$

Force=m a $\qquad$ Work=Force x distance

Power $= \frac{Workdone}{time}$ or Force x velocity or Pressure x volume flow (fluids)

Work done during 'n' revolutions = 2πT n

Potential energy = mgh $\qquad$ *Kinetic energy* $= \frac{1}{2}mv^2$ $\qquad \frac{1}{2}mv^2 - \frac{1}{2}mu^2 = mas$

Power=FV $\qquad$ work done = Tθ $\qquad$ Power=T ω

$\mu = \frac{F}{F_N} = \frac{Friction\ force}{Normal\ force\ between\ surfaces}$ $\qquad \tan \emptyset = \mu$

M.A $= \frac{Load\ lifted}{Effort\ applied} = \frac{W}{E}$ $\qquad$ VR $= \frac{\text{Distance moved by effort}}{\text{Distance moved by load}}$ $\qquad \eta = \frac{M.A.}{V.R.}$ x 100 %

Hydraulic jack; V.R. $= \frac{A}{a} \times$ Lever arm ratio

Stress $= \frac{Load\ (N)}{Area\ (m^2)}$ $\qquad E = \frac{stress}{Strain}$ $\qquad$ U.T.S $= \frac{\text{Maximum breaking load}}{\text{Original cross-sect. area}}$

Intensity of pressure on a plate= h w $=\rho gh$ $\qquad$ *Total pressure on a plate=Haw*

Formula for lifting machines would be on the question paper.