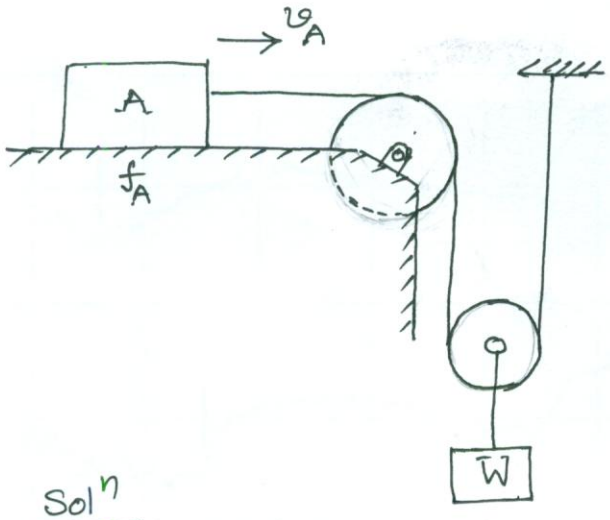
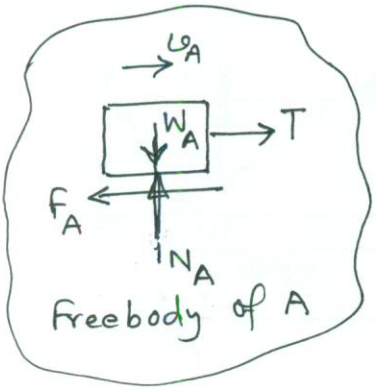
#1136/P.327



$W_A = 966$ lb
$f_A = 1/3$
$v_{A1} = 10$ fps
$v_{A2} = 35$ fps } in 25 s.

(a) $W = ?$
(b) S_W during 25 s. $= ?$
(c) Tension in cable $= ?$

Sol^n



Freebody of A

$v_{A2} = v_{A1} + a_A t$

$\Rightarrow 35 = 10 + a_A \times 25$

$\therefore a_A = 1$ fps^2

$a_w = \frac{a_A}{2} = 0.5$ fps^2

From the freebody of A

$\Sigma F_V = 0 \uparrow$ +ve

$N_A - W_A = 0$

$\therefore N_A = W_A = 966$ lb

$\therefore F_A = N_A \cdot f_A = 966 \times \frac{1}{3}$

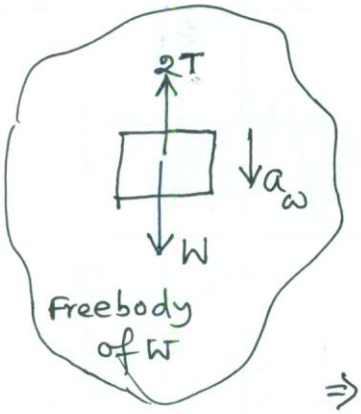
$= 322$ lb

$\Sigma F_H = 0 \rightarrow$ +ve

$T - F = \frac{W_A}{g} \cdot a_A$

$\Rightarrow T - 322 = \frac{966}{32.2} \times 1$

$\therefore T =$ **352 lb** Ans.



Freebody of W

From the freebody of the weight W

Taking $\Sigma F_V = ma \downarrow$ +ve

$W - 2T = \frac{W}{g} \cdot a_w$

$\Rightarrow W - 2 \times 352 = \frac{W}{32.2} \times 0.5$

$\therefore W =$ **715.12 lb** Ans.

$S_A = v_{A1} t + \frac{1}{2} a_A t^2 = 10 \times 25 + \frac{1}{2} \times 1 \times 25^2 = 562.5$ ft

$S_W = \frac{S_A}{2} = \frac{562.5}{2} =$ **281.25 ft** Ans.