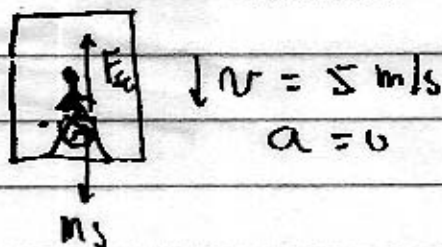


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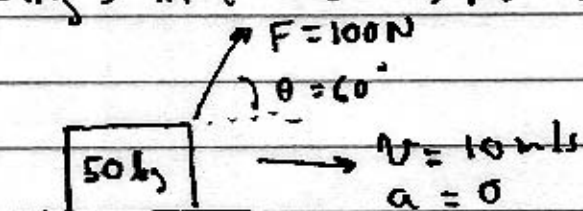
①

①



$$F_{sc} - m_s g = m_s a = 0 \Rightarrow F_{sc} = m_s g = 50 \times 9.8 \text{ N} = \boxed{490 \text{ N}}$$

②



$$W = F_x x = 100 \cos 60^\circ \times v t \text{ J}$$

$$= 100 \cos 60^\circ \times 10 \times 2 \text{ J} = \boxed{1000 \text{ J}}$$

③

$$\frac{1}{2} M v_i^2 + M g y_i = \frac{1}{2} M v_f^2 + M g y_f$$

$$v_f^2 = v_i^2 + 2g(y_i - y_f)$$

$$= 25 + 2 \times 9.8 \times 2 \text{ (m/s)}^2$$

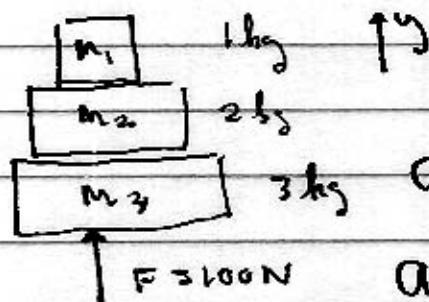
$$= 25 + 39.2 \text{ (m/s)}^2 \Rightarrow \boxed{v_f = 8.01 \text{ m/s}}$$

④

$$F \Delta t = M_e v_e = M_b v_b = 0.05 \times 10^3 \text{ Ns}$$

$$F = 0.05 \times 10^3 / 10^{-2} \text{ N} = 5 \times 10^{-2} \times 10^3 \times 10^2 \text{ N} = \boxed{5000 \text{ N}}$$

⑤



$$F - (m_1 + m_2 + m_3)g = (m_1 + m_2 + m_3)a_y$$

$$a_y = \frac{100 - 6 \times 9.8}{6} \text{ m/s}^2$$

$$a_y = +6.87 \text{ m/s}^2$$



$$F_{21} - m_1 g = m_1 a_y$$

$$F_{21} = m_1 (g + a_y) = 1(9.8 + 6.87) \text{ N}$$

$$= \boxed{16.7 \text{ N} = F_{12}}$$

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(2)

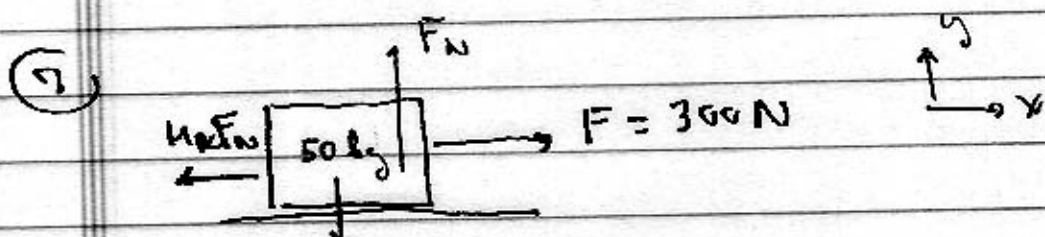
6

$$W_{\text{net}} = \Delta \left(\frac{1}{2} m v^2 + m g y \right)$$

$$= \frac{1}{2} \times 10^3 \times (10)^2 + 10^3 \times 9.8 \times 10 \text{ J}$$

$$= 0.5 \times 10^5 + 0.98 \times 10^5 \text{ J}$$

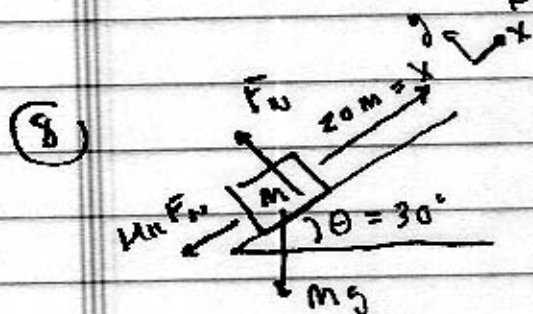
$$= 1.48 \times 10^5 \text{ J}$$



y: $F_N - Mg = 0$

x: $F - \mu_k F_N = M a_x = 0$

$\mu_k = F / F_N = F / Mg = 300 / (50 \times 9.8) = \boxed{0.61}$



$\mu_k = 0.6$

x: $-\mu_k F_N \times X = \Delta \left(\frac{1}{2} m v^2 + m g h \right)$

y: $F_N = m g \cos \theta$

$-\mu_k m g \cos \theta \times X = -\frac{1}{2} m v^2 + m g \times 5 \sin \theta$

$v^2 = \sqrt{2 \{ \mu_k g \cos \theta + g \sin \theta \} X}$

$= \sqrt{2 \times 9.8 \{ 0.6 \times 0.866 + 0.5 \} \times 20} \text{ m/s}$

$= \sqrt{400} \text{ m/s}$

$= \boxed{20 \text{ m/s}}$