

حل تریج‌های توان و بازده مصطفی کبیری فیزیکفا

تمرین ۱: $\bar{P}_i = 2 \text{ kW} = 2000 \text{ W}$ بازه ۷۵ درصد $\eta = 0.75$

$$\eta = \frac{\bar{P}}{\bar{P}_i} \rightarrow \bar{P} = \eta \bar{P}_i = 0.75 \times 2000 = \boxed{1500 \text{ W}}$$

$$W_F + W_{mg} = K_f - K_i = \frac{1}{2} m v_f^2$$

$$W_{mg} = -\Delta U = -mg \Delta h = -500 \times 10 \times 1 = -5000 \text{ J}$$

$$W_F - 5000 = \frac{1}{2} \times 500 \times v^2 = 1000$$

$$\boxed{W_F = 4000 \text{ J}}$$

$$\bar{P} = \frac{W_F}{\Delta t} \rightarrow \Delta t = \frac{W_F}{\bar{P}} = \frac{4000}{1500} = \boxed{2.67 \text{ s}}$$

تمرین ۲: $\bar{P}_i = 800 \text{ W}$, $\eta = 0.8$ $\bar{P} = \eta \bar{P}_i = 0.8 \times 800 = 480 \text{ W}$

$$\bar{P} = \frac{W}{\Delta t} \rightarrow W = \bar{P} \Delta t = 480 \times 10 = 4800 \text{ J}$$

$$W + W_{mg} = \Delta K = 0 \rightarrow W = -W_{mg} = \Delta U = mg \Delta h$$

$$4800 = 10 \times 10 \times \Delta h \rightarrow \Delta h = \frac{4800}{100} = \boxed{48 \text{ m}}$$

Telegram.me/physicfa

Instagram: @physicfa.ir

Website: physicfa.ir

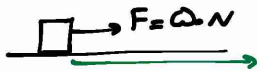
تمرین ۳:

$$\Delta h = 40 \times 25 \text{ cm} = 1000 \text{ cm} = 10 \text{ m}$$

چون انرژی ثابت است $\Delta K = 0$
 $W = -W_{mg} = \Delta U = mg \Delta h = 50 \times 10 \times 10 = 7500 \text{ J}$

$$\bar{P} = \frac{W}{\Delta t} = \frac{7500}{100} = 75 \text{ W}$$

تمرین ۴:



$$\bar{P} = Fv \cos \theta$$

$$\bar{P} = 50 \times 20 \times \frac{1}{5} = 1000 \text{ W}$$

تمرین ۵:

$$\bar{P}_i = 25 \text{ kW} = 25000 \text{ W}$$

$$\text{و } K = m v^2 = 1000 \times 4^2 = 16000 \text{ جبرگ}$$

از ۱۳ متره زیر زمین به ۱۷ متره بالای زمین یعنی $\Delta h = 30 \text{ m}$

چون انرژی ثابت است $\Delta K = 0$
 $W = \Delta U = mg \Delta h = 16000 \times 10 \times 30 = 1200000 \text{ J}$

$$\bar{P}_i = \frac{E}{\Delta t} \rightarrow E = \bar{P}_i \Delta t = 25000 \times 60 = 1500000 \text{ J}$$

↓
۱ دقیقه

$$\eta = \frac{W}{E} = \frac{1200000}{1500000} = 0.8$$

$$\text{درصد } = \eta \times 100 = 0.8 \times 100 = 80 \text{ درصد}$$

Telegram.me/physicfa

Instagram: @physicfa.ir

Website: physicfa.ir