

①

$$a) \eta = \frac{E_{\text{útil}}}{E_{\text{aportada}}} = \frac{304 \times 10^3 [\text{KW}] \times 1 [\text{DÍA}] \times 3600 \times 24 \left[\frac{\text{s}}{\text{DÍA}} \right]}{6000 \times 9,186 \left[\frac{\text{KJ}}{\text{kg}} \right] \times \text{Masa Carbón} [\text{kg}]} = 0,36$$

$$\Rightarrow \text{Masa Carbón} = \frac{304 \times 10^3 \times 3600 \times 24}{0,36 \times 6000 \times 9,186} = 2905 [\text{TONELADAS}] \quad // \quad (3,0)$$

$$b) \text{FACTOR PLANTA} = \frac{E_{\text{1 AÑO REAL}}}{E_{\text{1 AÑO NOMINAL}}} = \frac{2,191 \times 10^9 [\text{WH/AÑO}]}{304 \times 10^6 [\text{WH}] \times 24 \times 365 \left[\frac{1}{\text{AÑO}} \right]} = 0,82 \quad // \quad (3,0)$$

②

a) • ADIABÁTICO:

$$P_1 V_1^n = P_2 V_2^n$$

$$i) \quad v_1 = 10 \times 10^{-3} [\text{m}^3] \Rightarrow v_2 = 1,93 \times 10^{-3} [\text{m}^3] \quad T_2 = 575,3 [\text{K}]$$

$$\Delta W = -2301 [\text{J}] \quad \text{OJO} \quad PV = nRT \Rightarrow \text{Masa Air} = 0,0116 \text{ kg}$$

$$\Delta W = \frac{P_1 V_1}{1-n} \left[\left(\frac{v_2}{v_1} \right)^{1-n} - 1 \right]$$

$$ii) \quad v_2 = \frac{RT_1}{P_1} = 0,8552 \left[\frac{\text{m}^3}{\text{kg Air}} \right] \Rightarrow v_2 = 0,165 \left[\frac{\text{m}^3}{\text{kg Air}} \right] \quad T_2 = 575,3 [\text{K}]$$

$$\Delta W = -199,1 \left[\frac{\text{KJ}}{\text{kg Air}} \right] \quad (0,75)$$

• ISOÉRMICO

$$P_1 V_1 = P_2 V_2$$

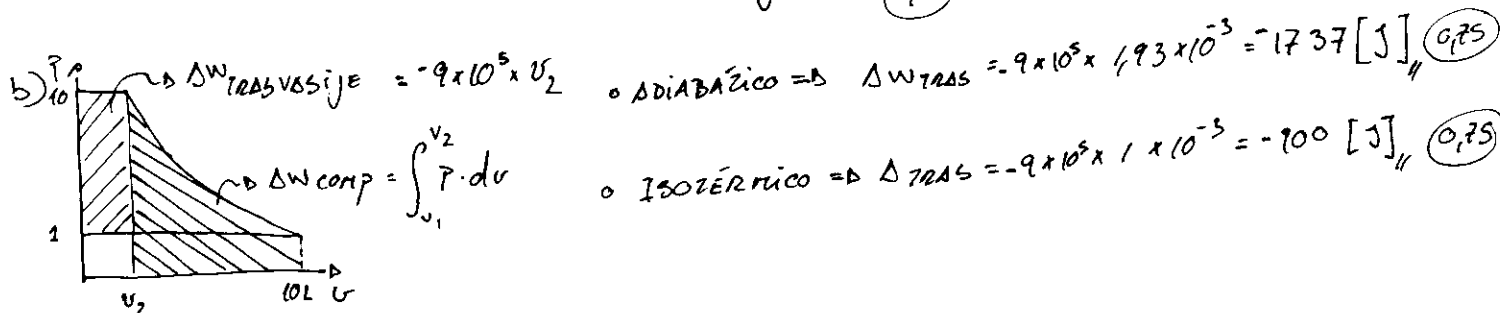
$$T_1 = T_2$$

$$i) \quad v_1 = 10 \times 10^{-3} [\text{m}^3] \Rightarrow v_2 = 1 \times 10^{-3} [\text{m}^3] \quad T_2 = 298 [\text{K}]$$

$$\Delta W = -2284,6 [\text{J}]$$

$$ii) \quad v_1 = \frac{RT_1}{P_1} = 0,8552 \left[\frac{\text{m}^3}{\text{kg Air}} \right] \Rightarrow v_2 = 0,08552 \left[\frac{\text{m}^3}{\text{kg Air}} \right] \quad T_2 = 298 [\text{K}]$$

$$\Delta W = -196,930 \left[\frac{\text{KJ}}{\text{kg Air}} \right] \Rightarrow -2284,3 [\text{J}] \quad (0,75)$$



$$c) \Delta W_{\text{COMP}} + \Delta W_{\text{TRANS}} \quad \bullet \text{ADIABÁTICO} = -2301 - 1737 = -4038 [\text{J}] \quad (0,75)$$

$$\text{ISOÉRMICO} = -2284,3 - 900 = -3184,3 [\text{J}] \quad (0,75)$$