

$$1. - C_t = 3 \text{ máquinas} \cdot 10 \frac{\text{l}}{\text{min}} \cdot 25 \frac{\text{días}}{\text{mes}} \cdot 16 \frac{\text{horas}}{\text{día}} \cdot 60 \frac{\text{min}}{\text{h}} = 720.000 \frac{\text{l}}{\text{mes}}$$

$$C_r = 170.500 \text{ l/mes}$$

$$C_e = 720.000 \cdot 0,9 = 648.000 \text{ l/mes}$$

$$\text{Utilización} = \frac{C_r}{C_t} = \frac{170.500}{720.000} = \boxed{23,6\%}$$

$$\text{Eficiencia} = \frac{C_r}{C_e} = \frac{170.500}{648.000} = \boxed{26,3\%}$$

$$2. - \text{Eficiencia} = \frac{C_r}{C_e} = 0,18$$

$$C_t = 720 \frac{\text{unid}}{\text{hora}} \cdot 8 \frac{\text{horas}}{\text{día}} \cdot 6 \frac{\text{días}}{\text{semana}} = 34.560 \frac{\text{unid}}{\text{semana}}$$

$$C_r = C_t \cdot 0,18 = 34.560 \cdot 0,18 = 27.648 \frac{\text{unid}}{\text{semana}}$$

$$3. - C_t = 18 \frac{\text{cajas}}{\text{min}} \cdot \frac{60 \text{ min}}{1 \text{ hora}} \cdot \frac{24 \text{ h}}{\text{día}} = 25.920 \frac{\text{cajas}}{\text{día}}$$

$$C_e = 18 \frac{\text{cajas}}{\text{min}} \cdot \frac{60 \text{ min}}{1 \text{ hora}} \cdot \frac{22,5 \text{ h}}{\text{día}} = 24.300 \frac{\text{cajas}}{\text{día}}$$

$$\text{Tiempo para el día} = \frac{14 \text{ min}}{\text{hora}} \cdot \frac{24 \text{ h}}{\text{día}} = 336 \frac{\text{min}}{\text{día}} \cdot \frac{1 \text{ h}}{60 \text{ min}} = 5,6 \frac{\text{h}}{\text{día}}$$

$$C_r = 18 \frac{\text{cajas}}{\text{min}} \cdot \frac{60 \text{ min}}{1 \text{ hora}} \cdot \frac{(22,5 - 5,6) \text{ h}}{\text{día}} = 18.252 \frac{\text{cajas}}{\text{día}}$$

$$E = \frac{C_r}{C_e} = \frac{18.252}{24.300} = \boxed{75,1\%}$$