

$$\begin{aligned} \#1) \quad A_A &= 550 \text{ km}^2 \\ A_B &= 750 \text{ km}^2 \\ A_C &= 250 \text{ km}^2 \\ \hline &1550 \text{ km}^2 \end{aligned}$$

$$H_A = \frac{4,36 \cdot 24 \cdot 3600 \cdot 365^2}{550 \cdot 10^6} = 0,250 \text{ m} = 250 \text{ mm}$$

$$H_B = \frac{(13,64 - 4,36 + 0,15) \cdot 24 \cdot 3600 \cdot 365^2}{750 \cdot 10^6} = 0,397 \text{ m} = 397 \text{ mm}$$

$$H_C = \frac{(16,41 - 13,64) \cdot 24 \cdot 3600 \cdot 365^2}{250 \cdot 10^6} = 0,349 \text{ m} = 349 \text{ mm}$$

$$H_{\text{TOTAL}} = \frac{550}{1550} \cdot 250 + \frac{750}{1550} \cdot 397 + \frac{250}{1550} \cdot 349 = 337 \text{ mm} \quad \downarrow \approx$$

$$H_{\text{TOTAL}} = (16,41 + 0,15) \cdot 24 \cdot 3600 \cdot 365 / 1550 \cdot 10^6 = 332 \text{ mm}$$

#2)

$$R_A = (100 - 15) - 5 = 80 \text{ W/m}^2$$

$$R_A = 80 \cdot 24 \cdot 3600 = 6,912 \text{ MJ/m}^2$$

$$ETP = 6,912 / 2,5 = 2,764 \text{ kg/m}^2 = 2,764 \text{ l/m}^2$$

$$= 2,764 \text{ mm}$$

#3)

$$Q_p = 40 (2,5 - 0,2)^{0,3} = 57,4 \text{ m}^3/\text{s}$$

$$\bar{Q} = 20 \text{ m}^3/\text{s}$$

$$S_{ce} = 0,45 \cdot 20 = 9 \text{ m}^3/\text{s} \rightarrow Q_p = \bar{Q} + k \cdot S_{ce}$$

$$k = \frac{57,4 - 20}{9} = 3,5$$

$$K_G = 3,5 \rightarrow F(x) = 0,99 \rightarrow T = 100 \text{ anos.}$$

#4)

$$\frac{Q_{\text{med}}}{\bar{Q}} = 0,8$$

$$\bar{Q} = \frac{7}{0,8} = 8,75 \text{ m}^3/\text{s}$$

$$\text{Vol} = 8,75 \cdot 365 \cdot 24 \cdot 3600 = 275 \cdot 10^6 \text{ m}^3 = 275 \text{ km}^3$$

$$H = \frac{\text{Vol}}{A} = 230 \text{ mm}$$

#5) If $P = 40 \text{ mm}$ and $EP = 15 \text{ mm} \rightarrow ER = 15 \text{ mm}$

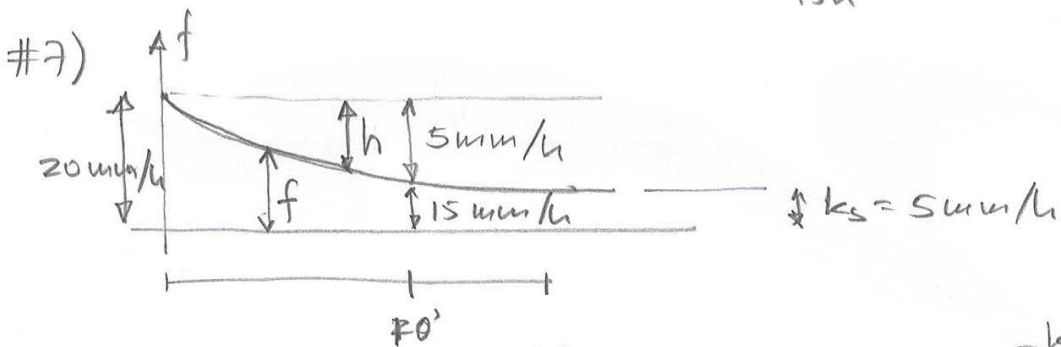
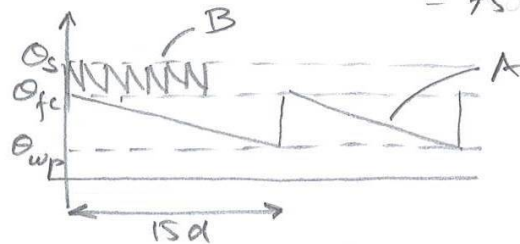
$$H_{T-1} = 80 \text{ mm}$$

$$H_T = 80 + 40 - 15 = 105 \text{ mm} \rightarrow \text{Excess} = 25 \text{ mm} < 80 \text{ mm}$$

#C) (A) $\text{Vol}^{\text{max}} = h \cdot (\theta_{cc} - \theta_{wp}) = 0,5 \cdot (0,3 - 0,15) = 0,075 \text{ m} = 75 \text{ mm}$

$$\Delta t = 75/5 = 15 \text{ d.}$$

(B) $\text{Vol} = 5 + 1 = 6 \text{ mm}$



$$f = f_0 + (f_0 - f_c) e^{-kt}$$

$$15 = 20 + (20 - 5) e^{-k \cdot 10}$$

$$k = 395,5 \text{ 1/min}$$

$$k = 6,6 \text{ 1/h}$$

$$k = 0,27 \text{ 1/d}$$

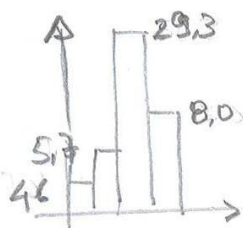
#9 $T_c = 4h$

$$P(1h) = 10 \cdot (60)^{0,35} = 41,9 \text{ mm} \quad \begin{matrix} 41,9 \text{ mm} \\ \times 0,7 \\ \hline 29,3 \text{ mm} \end{matrix}$$

$$P(2h) = 10 \cdot (120)^{0,35} = 53,4 \text{ mm} \quad \begin{matrix} 11,5 \text{ mm} \\ \times 0,7 \\ \hline 8,0 \text{ mm} \end{matrix}$$

$$P(3h) = 10 \cdot (180)^{0,35} = 61,6 \text{ mm} \quad \begin{matrix} 8,1 \text{ mm} \\ \times 0,7 \\ \hline 5,7 \text{ mm} \end{matrix}$$

$$P(4h) = 10 \cdot (240)^{0,35} = 68,1 \text{ mm} \quad \begin{matrix} 6,5 \text{ mm} \\ \times 0,7 \\ \hline 4,6 \text{ mm} \end{matrix}$$



HV					$Q (\text{m}^3/\text{s})$
0	0				0
15	6,9	0			6,9
30	13,7	31,3	0		44,9
20	9,1	62,5	142,7	0	214,3
10	4,6	41,7	285,4	657,6	983,3
0	0	20,8	190,3	1303,1	1516,3
		0	95,1	868,8	963,9
			0	434,4	434,4

10)

