Ejercicios Tema 2

Ejercicio 1

$$T_{sec} = 0{,}2 \cdot t_{par} + 3 \cdot 0{,}6 \cdot t_{par} + 4 \cdot 0{,}2 \cdot T_{par} = (0{,}2 + 1{,}8 + 0{,}8)$$

$$T_{par} = 2{,}8 \cdot t_{par} = 112\ s$$

Ganancia: $$\frac{t_{sec}}{t_{par}} = \frac{2{,}8 \cdot T_{par}}{T_{par}} = 2{,}8$$

Eficiencia $$\frac{S(p)}{p} = \frac{2{,}8}{4} = 0{,}7$$

Ejercicio 2:

a) $$T_p^{p1}(1/2) = \frac{20\ s}{2} = 10\ s$$

$$t_p^{p2}\left(\frac{1}{2}\right) = \frac{30\ s}{2} = 15\ s$$

$$t_p^{p1,p2} = \max\left(T_p^{p1}, T_p^{p2}\right) = 15\ s$$

b) $$t_p^{p1}(x) = t_p^{p2}(x-1) \rightarrow 20\ s \cdot x = 30 \cdot (1-x) \rightarrow 2x = 3(1-x) \rightarrow x = 3/5$$

$3/5$ en p1

$2/5$ en p2

$$t_p^{p1}(3/5) = 20\ s \cdot \frac{3}{5} = 12\ s$$

Ejercicio 3

$$f_p = \frac{8 \cdot 50\ ns}{T_s} = \frac{8 \cdot 50\ ns}{50\ ns + 8 \cdot 50\ ns} = \frac{8}{9}$$

Ejercicio 4

a) $S(p) = \frac{t_s}{t_p} = \frac{t_s}{0{,}25 \cdot t_s + \frac{0{,}75 \cdot t_s}{p}} = \frac{1}{0{,}25 + \frac{0{,}75}{p}}$ $p \geq 4 \rightarrow S = 4$

b)

$$S(p) = \frac{1}{0{,}25 + \frac{0{,}25}{p}} \geq 2 \rightarrow 1 \geq 0{,}5 + \frac{1{,}5}{p} \rightarrow 0{,}5 \geq \frac{1{,}5}{p}$$

$$\rightarrow p \geq \frac{1{,}5}{0{,}5} = 3$$

Ejercicio 5

a)

$$t_p(4) = (0{,}1 + 0{,}5 + 0{,}15) \cdot t_s + 0{,}5 \cdot t_s + 0{,}05 \cdot t_s = 0{,}55\, t_s =$$

$$= 33\,s$$

$$S(4) = \frac{t_s}{t_p(4)} = \frac{t_s}{0{,}55\, t_s} = 1{,}8$$

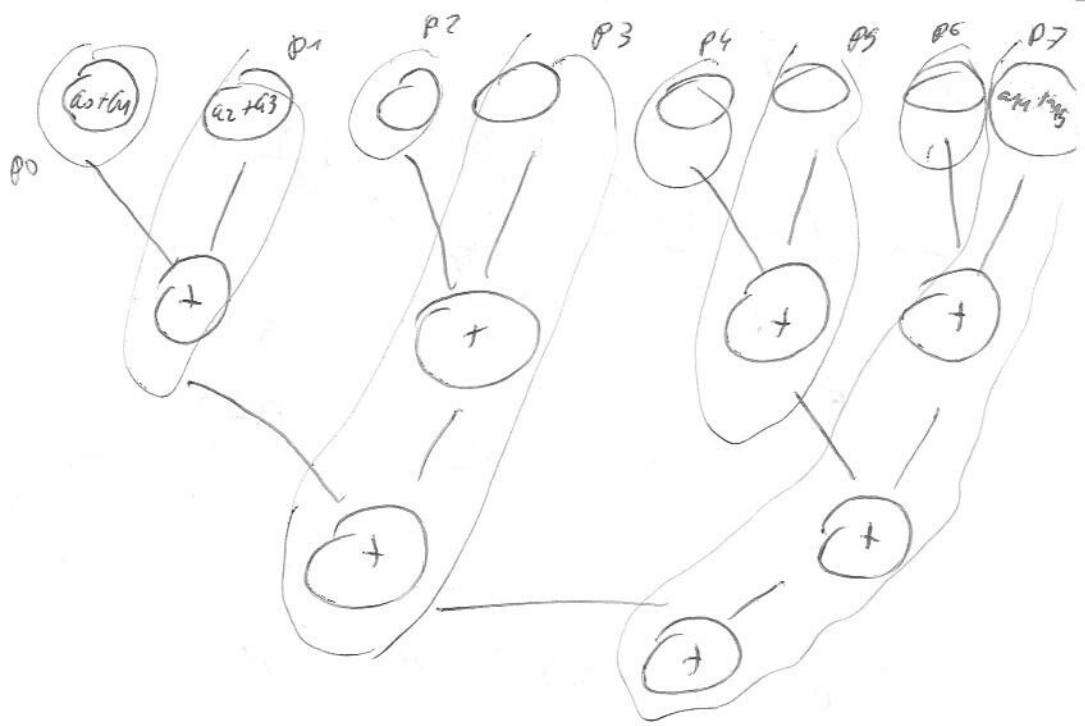
b) $t_p(2) = (0{,}1 + 0{,}1 + 0{,}15)\, t_s + 2 \cdot 0{,}15 \cdot t_s + 2 \cdot 0{,}05 \cdot t_s =$

$$= (0{,}35 + 0{,}3 + 0{,}1)\, t_s = 0{,}75 \cdot 60\,s = 45\,s$$

$$S(4) = \frac{t_s}{t_p(4)} = \frac{t_s}{0{,}75 \cdot t_s} = \frac{1}{0{,}75} = 1{,}3$$

Ejercicio 8

a)



$n = 8$

$p = 16$

$\frac{n}{p} = \frac{16}{8} = 2$

(+) 1 unidad

b) $T(p,n) = T(p,n) + T_s(p,n)$

$T_c(p,n) = \left(\frac{n}{p} - 1\right) + \log_2 p$

c) $T_{c/s}(p) = \log_2 p$

d) $S(p,n) = \frac{T_s}{T_p(p,n)} = \frac{n-1}{\frac{n}{p} - 1 + 2\log_2 p}$

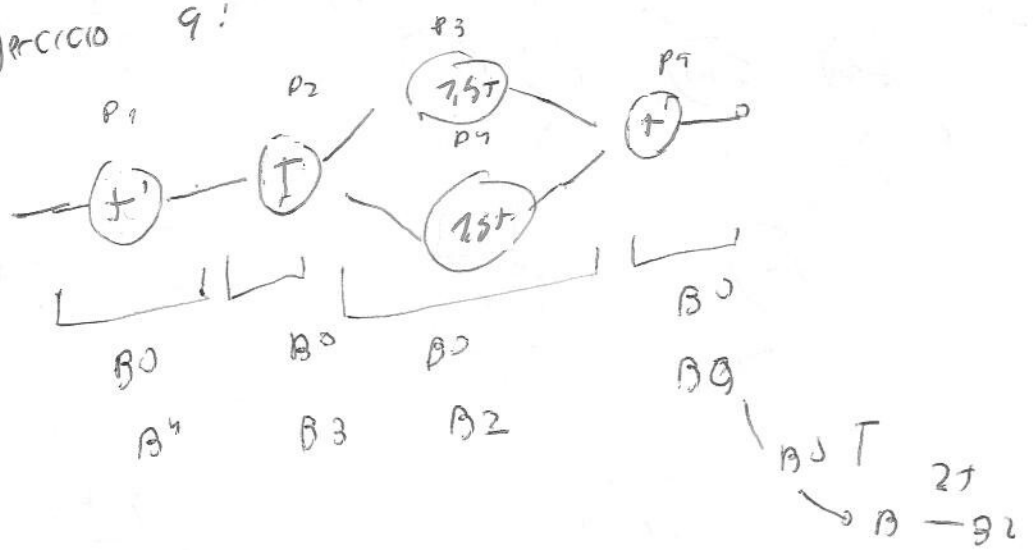
e) $T_p(p) = \left(\frac{n}{p} - 1\right) + 2 \times \log_2 p$

$T'_p(p) = -\frac{n}{p^2} + \frac{2}{p \times L2} = 0 \rightarrow \frac{n}{p} = \frac{2}{L2} \rightarrow p \frac{n \cdot L2}{2} = 1{,}38 \cdot n$

$T''_p(p) = \frac{2 \cdot p \cdot n}{p^4} - \frac{2}{L2 \cdot p^2} = \frac{2n}{p^3} - \frac{2}{L2 \cdot p^2} > 0 \rightarrow \frac{2 \cdot n}{p^3} >$

$\frac{2}{L2 \cdot p^2} \rightarrow \frac{n}{p} > \frac{1}{L2} \rightarrow L2 \cdot n > p$

Ejercicio 9:



$$t_p(5,n) = 4,5\,T + (n-1)\,1,5T$$

a) $S(5,n) = \frac{t_s}{t_p(5,n)} = \frac{6\,T \times n}{4,5T + (n-1)1,5T} = \frac{6n}{3+n1,5} \xrightarrow{n>>} \frac{6}{1,5} = 4$

b) $S(4,n) = \frac{t_s}{t_p(4,n)} = \frac{6\,T \times n}{1,5T + (n-1)2T} = \frac{6n}{2,5+2n} \xrightarrow{n>>} 3$

Ejercicio 10

p.i	k, a, b, x	$A_i = x - a_i$	todos reducen (A_i, x, B_i) $B_i = \prod(x-a_i)$
p0	$k_0\ a_0\ b_0\ x$	$x-a_0$	$(x-a_0)(x-a_1)(x-a_2)(x-a_3)$
p1	$k_1\ a_1\ b_1\ x$	$x-a_1$	
p2	$k_2\ a_2\ b_2\ x$	$x-a_2$	
p3	$k_3\ a_3\ b_3\ x$	$x-a_3$	

$L_i = \frac{B_i}{A_i k_i}$

b_0	$(x-a_1)(x-a_2)(x-a_3)/k_0$
b_1	$(x-a_0)(x-a_2)(x-a_3)/k_1$
b_2	$(x-a_0)(x-a_1)(x-a_3)/k_2$
b_3	$(x-a_0)(x-a_1)(x-a_2)/k_3$

$A = x - a$

todos reducen (A, B, x)

$L_b = \frac{B\,b}{A\,k}$

Reduccion (L_b, P_{it})