

Problema 6.1

$$\text{dist} := \begin{bmatrix} 0 & 200 & 400 & 570 & 400 & 220 \\ 200 & 0 & 200 & 450 & 580 & 360 \\ 400 & 200 & 0 & 400 & 570 & 560 \\ 570 & 450 & 400 & 0 & 400 & 620 \\ 400 & 580 & 570 & 400 & 0 & 220 \\ 220 & 360 & 560 & 620 & 220 & 0 \end{bmatrix} \quad \text{Ruta} := \begin{bmatrix} 0 & 2 & 2 & 4 & 5 & 6 \\ 1 & 0 & 3 & 4 & 6 & 6 \\ 2 & 2 & 0 & 4 & 5 & 2 \\ 1 & 2 & 3 & 0 & 5 & 5 \\ 1 & 6 & 3 & 4 & 0 & 6 \\ 1 & 2 & 2 & 5 & 5 & 0 \end{bmatrix}$$

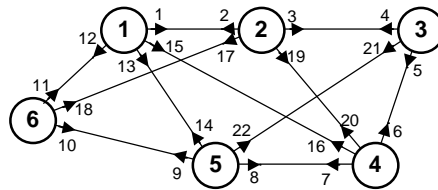
Problema 6.2

a)

$$\gamma_{\text{matriu}} := \begin{bmatrix} 0 & 3.750000000 & 2.500000000 & 2.192982456 & 1.250000000 & 3.409090910 \\ 3.750000000 & 0 & 15.000000000 & 8.333333333 & 2.697841727 & 6.250000001 \\ 2.500000000 & 15.000000000 & 0 & 12.500000000 & 3.508771930 & 5.703422053 \\ 2.192982456 & 8.333333334 & 12.500000000 & 0 & 6.250000000 & 7.102272728 \\ 1.250000000 & 2.697841727 & 3.508771930 & 6.250000000 & 0 & 6.818181818 \\ 3.409090909 & 6.250000001 & 5.703422054 & 7.102272728 & 6.818181818 & 0 \end{bmatrix}$$

$$\gamma_{\text{total}} := 174.5317939$$

b)



enlace i	I_i (paq/seg)	tráfico del enlace
1	6.250000000	[1, 2], [1, 3]
2	6.250000000	[2, 1], [3, 1]
3	23.20342205	[1, 3], [2, 3], [6, 3]
4	23.20342205	[3, 1], [3, 2], [3, 6]
5	12.500000000	[3, 4]
6	12.500000000	[4, 3]
7	13.35227273	[4, 5], [4, 6]
8	13.35227273	[5, 4], [6, 4]
9	16.61829627	[4, 6], [5, 2], [5, 6]
10	16.61829627	[2, 5], [6, 4], [6, 5]
11	3.409090909	[6, 1]
12	3.409090910	[1, 6]
13	1.250000000	[1, 5]
14	1.250000000	[5, 1]
15	2.192982456	[1, 4]
16	2.192982456	[4, 1]
17	14.65126378	[2, 5], [2, 6], [3, 6]
18	14.65126378	[5, 2], [6, 2], [6, 3]
19	8.333333333	[2, 4]
20	8.333333334	[4, 2]
21	3.508771930	[3, 5]
22	3.508771930	[5, 3]

c)

$$n := 1.206306669 \text{ enlaces}$$

Problema 6.3

a)

enlace i (bps)	Capacidad mínima (Km)	longitud (pts/bps)	d_i (pts/mes)	Coste mínimo
1	1875.000000	200	3.5800	11712.50000
2	1875.000000	200	3.5800	11712.50000
3	6961.026615	200	3.5800	29920.47528
4	6961.026615	200	3.5800	29920.47528
5	3750.000000	400	4.6600	22475.00000
6	3750.000000	400	4.6600	22475.00000
7	4005.681819	400	4.6600	23666.47728
8	4005.681819	400	4.6600	23666.47728
9	4985.488881	220	3.6880	23386.48299
10	4985.488881	220	3.6880	23386.48299
11	1022.727273	220	3.6880	8771.818183
12	1022.727273	220	3.6880	8771.818183
13	375.0000000	400	4.6600	6747.500000
14	375.0000000	400	4.6600	6747.500000
15	657.8947368	570	5.5780	8669.736842
16	657.8947368	570	5.5780	8669.736842
17	4395.379134	360	4.4440	24533.06487
18	4395.379134	360	4.4440	24533.06487
19	2500.000000	450	4.9300	17325.00000
20	2500.000000	450	4.9300	17325.00000
21	1052.631579	570	5.5780	10871.57895
22	1052.631579	570	5.5780	10871.57895
TOTAL:				376159.2687

b)

$$De := 386840.7313 \text{ pts/mes}$$

c)

enlace i	d_i (pts/bps)	I_i (paq/seg)	$DC_i^{(0)}$ (bps)	$DC_i^{(1)}$ (bps)	$DC_i^{(\infty)}$ (bps)
1	3.5800	6.250000000	3207.723347	3898.603641	3943.652197
2	3.5800	6.250000000	3207.723347	3898.603641	3943.652197
3	3.5800	23.20342205	11908.82538	7511.818656	3943.652197
4	3.5800	23.20342205	11908.82538	7511.818656	3943.652197
5	4.6600	12.50000000	4928.604971	4832.508612	3943.652197
6	4.6600	12.50000000	4928.604971	4832.508612	3943.652197
7	4.6600	13.35227273	5264.646221	4994.536915	3943.652197
8	4.6600	13.35227273	5264.646221	4994.536915	3943.652197
9	3.6880	16.61829627	8279.335833	6263.374516	3943.652197
10	3.6880	16.61829627	8279.335833	6263.374516	3943.652197
11	3.6880	3.409090909	1698.429734	2836.837268	3943.652197
12	3.6880	3.409090910	1698.429736	2836.837268	3943.652197
13	4.6600	1.250000000	492.8604971	1528.173403	3943.652197
14	4.6600	1.250000000	492.8604971	1528.173403	3943.652197
15	5.5780	2.192982456	722.3647778	1850.073201	3943.652197
16	5.5780	2.192982456	722.3647778	1850.073201	3943.652197
17	4.4440	14.65126378	6057.605010	5357.486768	3943.652197
18	4.4440	14.65126378	6057.605010	5357.486768	3943.652197
19	4.9300	8.333333333	3105.787581	3836.158174	3943.652197
20	4.9300	8.333333334	3105.787581	3836.158174	3943.652197
21	5.5780	3.508771930	1155.783644	2340.178061	3943.652197
22	5.5780	3.508771930	1155.783644	2340.178061	3943.652197

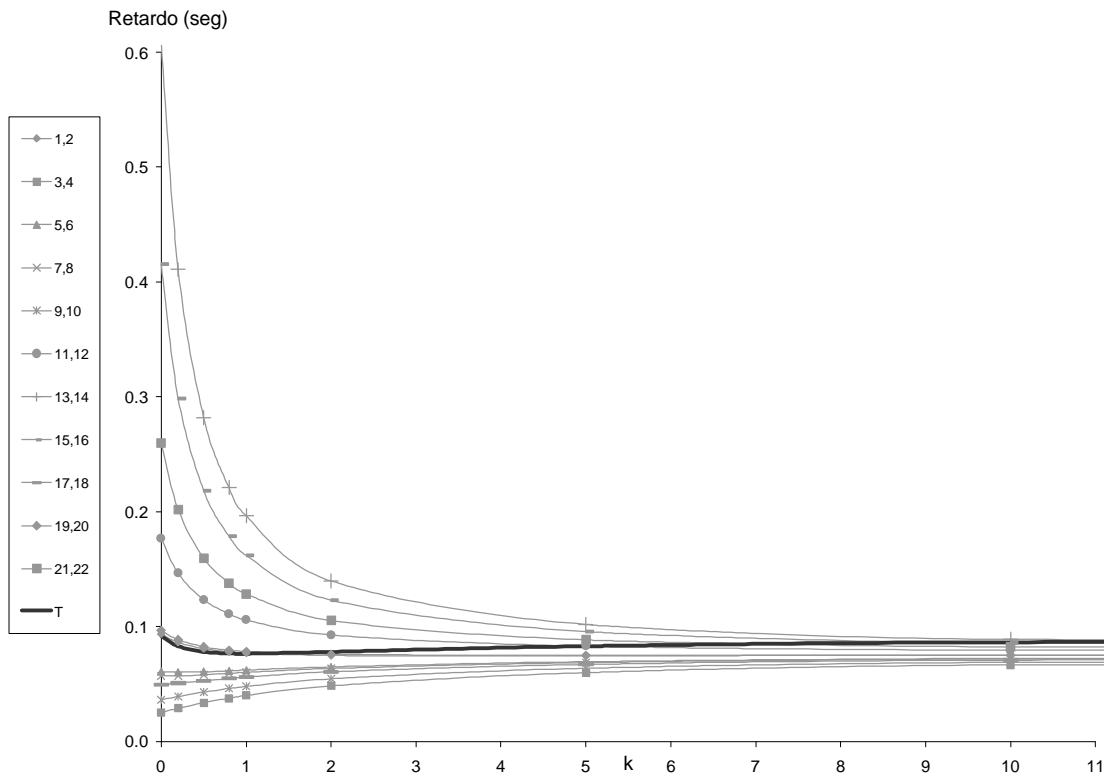
d)

enlace i	I_i (paq/seg)	$T_i^{(0)}$ (seg)	$T_i^{(1)}$ (seg)	$T_i^{(\infty)}$ (seg)
1	6.250000000	.093524	.076951	.076072
2	6.250000000	.093524	.076951	.076072
3	23.20342205	.025191	.039937	.076072
4	23.20342205	.025191	.039937	.076072
5	12.50000000	.060869	.062080	.076072
6	12.50000000	.060869	.062080	.076072
7	13.35227273	.056984	.060066	.076072
8	13.35227273	.056984	.060066	.076072
9	16.61829627	.036235	.047898	.076072
10	16.61829627	.036235	.047898	.076072
11	3.409090909	.176634	.105752	.076072
12	3.409090910	.176634	.105752	.076072
13	1.250000000	.608692	.196313	.076072
14	1.250000000	.608692	.196313	.076072
15	2.192982456	.415303	.162156	.076072
16	2.192982456	.415303	.162156	.076072
17	14.65126378	.049525	.055996	.076072
18	14.65126378	.049525	.055996	.076072
19	8.333333333	.096594	.078203	.076072
20	8.333333334	.096594	.078203	.076072
21	3.508771930	.259564	.128195	.076072
22	3.508771930	.259564	.128195	.076072

$$T_0 := .09176569905$$

$$T_1 := .07637614266$$

$$T_\infty := .09176569905$$



e)

retardo máximo extremo-extremo de un paquete = 0.1521432342 seg