

C.d.L. Ingegneria Informatica
 Prova scritta di ELETTRTECNICA del 22-10-2018

1) La rete in figura 1 è a regime prima dell'istante $t=0$ s, in cui avviene la chiusura dell'interruttore K. Si calcoli la corrente $i(t)$ per $t \geq 0$.

$$C = \frac{1}{6} \text{ F}, \quad g_m = \frac{1}{2} \text{ S},$$

STANDARD: $L = \frac{1}{3} \text{ H}, \quad R = 1 \Omega,$
 $v_g(t) = 10 \cos(3t) \text{ V}$

$$\left\{ \begin{array}{l} i(t) = 0e^{-3t} - \frac{25}{13}e^{-2t} - \frac{40}{13}\cos(3t) + \frac{70}{13}\sin(3t) \text{ A} \\ v_C(t) = 0e^{-3t} - \frac{30}{13}e^{-2t} + \frac{30}{13}\cos(3t) + \frac{110}{13}\sin(3t) \text{ V} \\ i_L(t) = 0e^{-3t} - \frac{30}{13}e^{-2t} - \frac{35}{13}\cos(3t) + \frac{45}{13}\sin(3t) \text{ A} \end{array} \right.$$

LIGHT: $L = 0 \text{ H}, \quad R = \frac{12}{11} \Omega,$
 $v_g(t) = \frac{20}{11} \cos(3t) \text{ V}$

$$\left\{ i(t) = -\frac{132}{1745}e^{-t} - \frac{2}{5}\cos(3t) + \frac{4}{5}\sin(3t) \text{ A} \right.$$

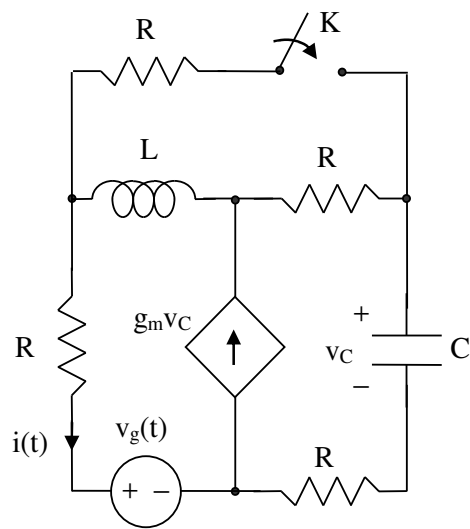


fig. 1.

2) Dato il doppio bipolo in regime sinusoidale di figura 2, calcolare la matrice di trasmissione diretta [T].

$$C = 1 \text{ F}, \quad R = 1 \Omega, \quad \omega = 1 \text{ rad/s}$$

STANDARD: $L = \frac{1}{3} \text{ H}, \quad M = \frac{1}{6} \text{ H}.$ $\left\langle T = \begin{bmatrix} j2 & j5 \Omega \\ jS & j2 \end{bmatrix} \right\rangle$

LIGHT: $L = \frac{1}{2} \text{ H}, \quad M = 0 \text{ H}.$ $\left\langle T = \begin{bmatrix} j2 & j5 \Omega \\ jS & j2 \end{bmatrix} \right\rangle$

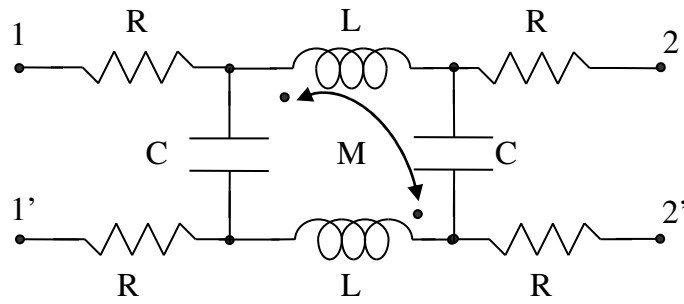


fig. 2.