Q 28_27

data

$R = 50\,\Omega$

$E_0 = 1V$

$L = 1H$

$C = 0,25F$

$q = 0,1$ e $i = -3,28151S$ em $t = 0$

$y_h(t) = ?$

$\lambda^2 + 50\lambda + 4 = 0$

$\lambda_1 = 0,08 \angle 180° = -0,08$

$\lambda_2 = 50 \angle 180° = -50$

$q(t) = y_h = C_1 e^{-0,08t} + C_2 \cdot e^{-50t}$

$q(0) = C_1 + C_2 = 0,1$

$q'(0) = -3,2815S = -0,08 \cdot C_1 - 50 C_2$

$C_1 = 0,0341$

$C_2 = 0,0659$

$y_h(t) = 0,034 \cdot e^{-0,08t} + 0,0659 \cdot e^{-50t}$ //

$y_p(t) = ?$

$$y'' + 50y' + 4y = \operatorname{sen}(\sqrt{3,5}\,t) \;//$$

y_x

$$y = A\cos(wt) + B\operatorname{sen}(wt)$$

$5x$

$$y' = -A.\sqrt{3,5}.\operatorname{sen}(wt) + B.\sqrt{3,5}\cos(wt)$$

$1x$

$$y'' = -A.3,5\cos(wt) - B.3,5\operatorname{sen}(wt)$$

$$(-3,5A + 50\sqrt{3,5}.B + 4A) = 0$$

$$(-B.3,5 - 50A\sqrt{3,5} + 4B) = 1$$

$$\begin{cases} 0,5A + 93,54B = 0 \\ 0,5B - 93,54A = 1 \end{cases} \qquad \begin{matrix} A = -0,01 \\ B = 0 \end{matrix} \;//$$

$$A = \frac{0,5B}{93,54} \qquad \frac{0,5^2 B}{93,54} + 93,54B = 0$$

$$y_p(t) = -0,01\cos(wt) \;//$$

$$y = -0,01\cos(wt) + 0,034.e^{-0,08t} + 0,0655.e^{-50t}$$