

# Soluciones de Ejercicios de Métodos I

## Curso 2004-2005. Hoja 4

1. .

a)  $x(t) = \frac{1}{140} e^{-t/200} \sin(14t)$  m

b)  $t = 0.224$  s

c)  $\omega_0 = 14$  rad/s,  $T_0 = 0.4488$  s

d)  $A = 6.96$  mm,  $\phi = 2\pi/7$

2.  $Q(t) = \cos(2000t)$   $\mu\text{C}$

3. a)  $\gamma_c = 9.03$  N s/m

4. .

$$I(t) = 10 (e^{-1000t} - e^{-500t}) \text{ mA}$$

$$R_c = 282.84 \Omega$$

5. .

$$x_p(t) = 2 \cos(t/2 - 0.05) \text{ cm}$$

$$\omega_{\max} = 7 \text{ rad/s}$$

6.  $x_p(t) = 15 \cos(3t - 2.43)$  cm

7. .

$$Q(t) = 3 + 0.154 e^{-28601.5t} - 3.154 e^{-1398.5t} \mu\text{C}$$

$$I_{\max} = 4 \text{ mA}$$

8. .

a)  $\omega = \frac{1}{3}$ ;  $u(t) = -1.38 e^{-t/16} \cos(\frac{\sqrt{255}}{16}t - 0.1) + 3.37 \cos(t/3 - 0.05)$

b)  $\omega = 1$ ;  $u(t) = 23.98 e^{-t/16} \cos(\frac{\sqrt{255}}{16}t + 1.5) + 24 \sin t$

c)  $\omega = 3$ ;  $u(t) = 2.37 e^{-t/16} \cos(\frac{\sqrt{255}}{16}t - 0.04) + 0.375 \cos(3t - 3.09)$