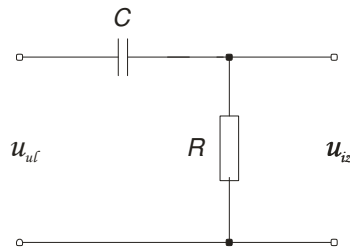


10. domaća zadaća iz Analognih sklopova i Elektroničkih sklopova

1. Na spoj sa slike dovodi se ulazni napon $u_{ul} = 15\sin 10^3 t + 20\sin 3 \cdot 10^3 t$, V. Poznato je: $R = 39 \text{ k}\Omega$, $C = 22 \text{ nF}$. Izračunajte izlazni napon u_{iz} .

**Rješenje:**

$$A(j\omega) = \frac{\dot{U}_{iz}}{\dot{U}_{ul}} = \frac{R \cdot \dot{I}}{\left(R + \frac{1}{j\omega C}\right) \cdot \dot{I}} \cdot \frac{j\omega C}{j\omega C} = \frac{j\omega RC}{1 + j\omega RC}$$

$$u_{ul} = U_{ul1m} \sin \omega_1 t + U_{ul2m} \sin \omega_2 t$$

$$u_{iz} = U_{iz1m} \sin(\omega_1 t + \varphi_1) + U_{iz2m} \sin(\omega_2 t + \varphi_2)$$

$$U_{iz1m} = |A(j\omega_1)| \cdot U_{ul1m}$$

$$\varphi_1 = 90 - \arctg \omega_1 RC$$

$$U_{iz2m} = |A(j\omega_2)| \cdot U_{ul2m}$$

$$\varphi_2 = 90 - \arctg \omega_2 RC$$

$$\omega_1 = 10^3 \frac{\text{rad}}{\text{s}} \quad \omega_2 = 3 \cdot 10^3 \frac{\text{rad}}{\text{s}}$$

$$|A(j\omega_1)| = \frac{\omega_1 RC}{\sqrt{1 + (\omega_1 RC)^2}} = 0,6512$$

$$U_{iz1m} = 9,767 \text{ V}$$

$$\varphi_1 = 49,37^\circ$$

$$|A(j\omega_2)| = \frac{\omega_2 RC}{\sqrt{1 + (\omega_2 RC)^2}} = 0,9321$$

$$U_{iz2m} = 18,64 \text{ V}$$

$$\varphi_2 = 21,23^\circ$$

$$u_{iz} = 9,767 \sin(10^3 t + 49,37^\circ) + 18,64 \sin(3 \cdot 10^3 t + 21,23^\circ), \text{ V}$$