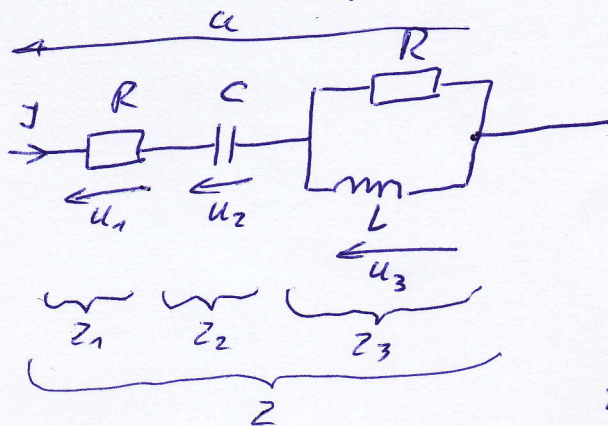


# KOŁOKWIUM I, grupa D

## ZADANIE 2: Rozwiązanie



$$Z_1 = R$$

$$Z_2 = \frac{1}{j\omega C}$$

$$Z_3 = \frac{R \cdot j\omega L}{R + j\omega L}$$

$$Z = Z_1 + Z_2 + Z_3$$

$$J = \frac{u}{Z} = \frac{u_1}{Z_1} = \frac{u_2}{Z_2} = \frac{u_3}{Z_3}$$

$$\Downarrow$$

$$\frac{u_1}{u_2} = \frac{Z_1}{Z_2} = j\omega CR$$

Z warunku zadania:

$$|u_1| = 2|u_2| \Rightarrow \frac{|u_1|}{|u_2|} = 2 = \omega CR \Rightarrow R = \frac{2}{\omega C} = \underline{\underline{2 \text{ k}\Omega}} \quad (3 \text{ pkt})$$

$$\frac{u_2}{u_3} = \frac{Z_2}{Z_3} = \frac{\frac{1}{j\omega C}}{\frac{R \cdot j\omega L}{R + j\omega L}} = \frac{R + j\omega L}{-\omega^2 RLC}$$

Z warunku zadania:

$$\text{ang}\left(\frac{u_2}{u_3}\right) = -\frac{3}{4}\pi$$

$$\text{ang}\left(\frac{u_2}{u_3}\right) = -\pi + \text{arctg}\left(\frac{\omega L}{R}\right) = -\frac{3}{4}\pi$$

$$\text{arctg}\left(\frac{\omega L}{R}\right) = 1$$

$$\Downarrow$$

$$L = \frac{R}{\omega} = \underline{\underline{2 \text{ mH}}} \quad (3 \text{ pkt})$$

