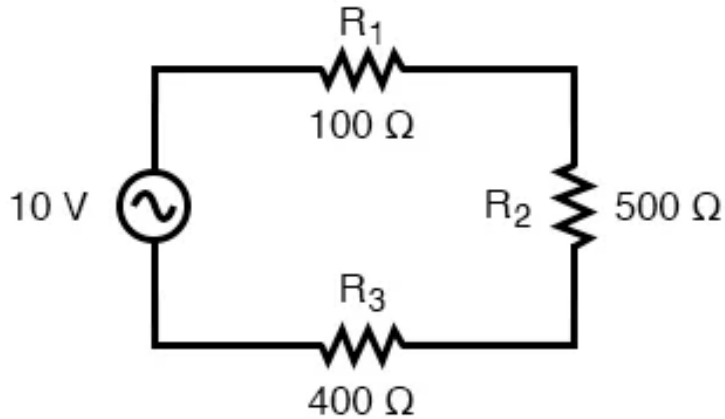


PRACTICE

Q) Find the voltage drop across each resistor in the circuit given.



$$I = \frac{V}{R_{eq}}$$

$$R_{eq} = 100 + 500 + 400 = 1000\Omega(1k\Omega)$$

Series circuit – current same

$$I = \frac{10}{1000} = 0.01A = 10mA$$

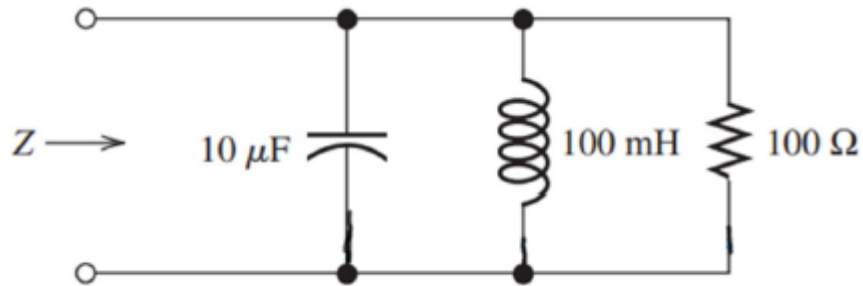
$$V_{R1} = I \times R_1 = 1V$$

$$V_{R2} = I \times R_2 = 5V$$

$$V_{R3} = I \times R_3 = 4V$$

PRACTICE

Q) Find complex impedance of the network shown, take $\omega = 500$ rad/s



$$R_{eq} = \frac{1}{\left(\frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}\right)}$$

$$Z_{eq} = \frac{1}{\left(\frac{1}{R} + \frac{1}{Z_C} + \frac{1}{Z_L}\right)}$$

$$Z_C = \frac{-j}{\omega C} = \frac{-j}{500 \times 10 \times 10^{-6}} = -200j$$

$$Z_L = j\omega L = j \times 500 \times 100 \times 10^{-3} = 50j$$

$$Z_{eq} = \frac{1}{\left(\frac{1}{100} - \frac{1}{200j} + \frac{1}{50j}\right)}$$

$$= 1/(1/100 - 1/200i + 1/50i)$$

$$Z_{eq} = 30.76 + 46.15j$$

PRACTICE

Q) The current through a certain circuit element is given by $i(t) = 4e^{-t} A$.

Find the net charge that passes through that element in time interval $t=0$ to $t= \infty$

$$q(t) = \int_{t_0}^t i(t) dt + q(t_0)$$

$$i(t) = \int_0^{\infty} 4e^{-t} dt + 0$$

$$i(t) = -4 \left[e^{-t} \right]_0^{\infty}$$

$$i(t) = -4 \left(\frac{1}{e^{\infty}} - \frac{1}{e^0} \right) = -4[0 - 1]$$

$$Ans : q(t) = 4C$$