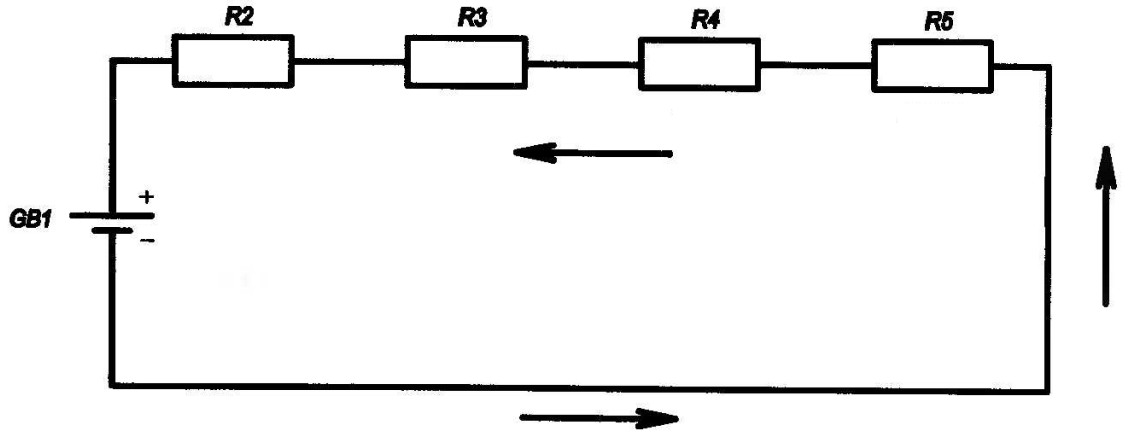
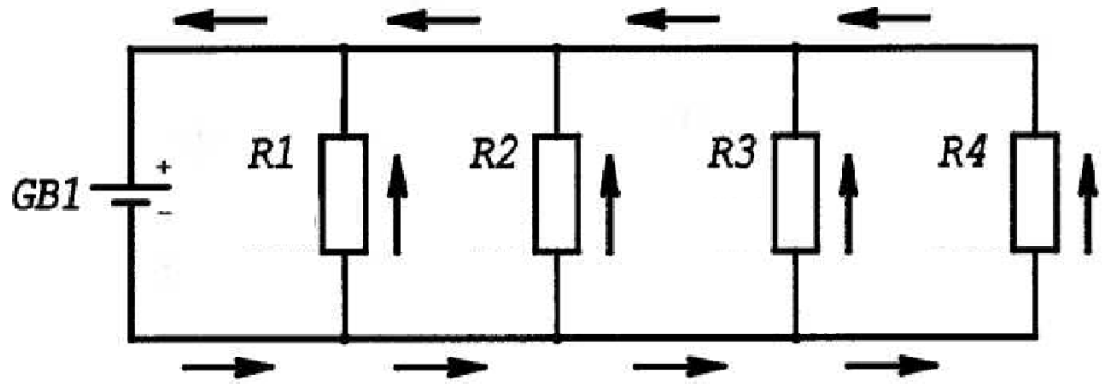
Task:

Y the charge n voltage remain constant when capacitors R connected in series. N parallel. Respectively???

Solution:





Due to Ohm's law

$$I = \frac{\varepsilon}{R + r}$$

$\varepsilon -$ electromotive force,

$R -$ resistance of the elements

$r -$ inner resistance

$$I_i = \frac{U_i}{R_i}$$

When capacitors R are connected in series:

$$\varepsilon = \sum_{i=1}^{N} U_i$$

$$I_i = I - constant$$

$$IR + Ir = \sum_{i=1}^{N} I_i R_i = I \sum_{i=1}^{N} R_i$$

Divide by I:

$$R + r = \sum_{i=1}^{N} R_i$$

When capacitors R are connected in parallel:

$$\varepsilon = U_i - constant$$

$$I = \sum_{i=1}^{N} I_i$$

$$\frac{\varepsilon}{R + r} = \sum_{i=1}^{N} \frac{U_i}{R_i} = \varepsilon \sum_{i=1}^{N} \frac{1}{R_i}$$

Divide by ε:

$$\frac{1}{R + r} = \sum_{i=1}^{N} \frac{1}{R_i}$$

Answer:

When capacitors R are connected in series I remains constant.

When capacitors R are connected in parallel U remains constant.

That's why resistances are added in the ways described.