

# Tugas Listrik Statis

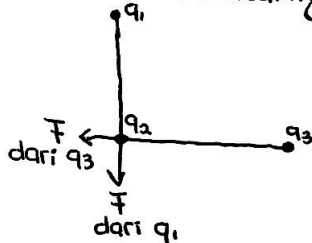
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Kelas : XII-6



1.) 
$$F = \frac{k \cdot q_1 \cdot q_2}{r^2}$$

Karena muatannya sama, maka gayanya saling menolak.



Karena ada 2 arah, berarti menggunakan Vektor.

$$\begin{aligned} \Sigma F &= \sqrt{F_1^2 + F_2^2 + 2 \cdot F_1 \cdot F_2 \cdot \cos \theta} \\ &= \sqrt{F^2 + F^2 + 2 F_2 \cdot \cos 90^\circ} \\ &= \sqrt{F^2 + F^2 + 2 F_2 \cdot 0} \\ &= \sqrt{2F^2} \\ &= F \sqrt{2} // \end{aligned}$$

2.) Dik :  $q_1 = +4 \mu C$   
 $q_2 = -2 \mu C$   
 $r_1 = 10 \text{ cm}$   
 $= 10 \cdot 10^{-2} \text{ m}$   
 $r_2 = 5 \text{ cm}$   
 $= 5 \cdot 10^{-2} \text{ m}$

Dit : Besar kuat medan listrik di titik A ?

Penye :  $\rightarrow$  Kuat medan di A disebabkan muatan  $q_1$  &  $q_2$

$$\begin{aligned} E_1 &= kq \frac{q_1}{r_1^2} \\ &= \frac{9 \cdot 10^9 \cdot 4 \cdot 10^{-6}}{100 \cdot 10^{-4}} \\ &= \frac{36 \cdot 10^7}{100} \\ &= 0,36 \cdot 10^7 \end{aligned}$$

$$\begin{aligned} E_2 &= kq \frac{q_1}{r_2^2} \\ &= \frac{9 \cdot 10^9 \cdot 2 \cdot 10^{-6}}{25 \cdot 10^{-4}} \\ &= \frac{18 \cdot 10^7}{25} \\ &= 0,72 \cdot 10^7 \end{aligned}$$

$\rightarrow$  Kuat medan total di A  $E_A = E_1 + E_2$

$$\begin{aligned} &= (0,36 \cdot 10^7) + (0,72 \cdot 10^7) \\ &= 1,08 \cdot 10^7 // \end{aligned}$$

3.)

Dik:  $q_A = 5 \cdot 10^{-8} \text{ C}$   
 $r_A = 10 \text{ cm} = 10 \cdot 10^{-2} \text{ m}$   
 $q_B = -40 \cdot 10^{-8} \text{ C}$   
 $r_B = 20 \text{ cm} = 20 \cdot 10^{-2} \text{ m}$   
 $q_C = 8 \cdot 10^{-8} \text{ C}$   
 $r_C = 10 \text{ cm} = 10 \cdot 10^{-2} \text{ m}$

Dit:  $V$  di titik B ?

Penye:  $V = k \frac{q}{r}$

$$V_{\text{total}} = V_A - V_B + V_C$$

$$= k \frac{q_A}{r_A} - k \frac{q_B}{r_B} + k \frac{q_C}{r_C}$$

$$= 9 \cdot 10^9 \left( \frac{5 \cdot 10^{-8}}{10 \cdot 10^{-2}} - \frac{40 \cdot 10^{-8}}{20 \cdot 10^{-2}} + \frac{8 \cdot 10^{-8}}{10 \cdot 10^{-2}} \right)$$

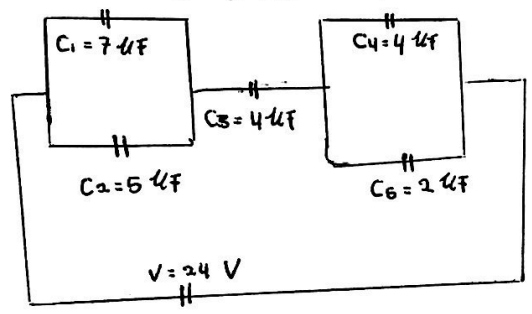
$$= 9 \cdot 10^9 (0,5 \cdot 10^{-6} - 2 \cdot 10^{-6} + 0,8 \cdot 10^{-6})$$

$$= 9 \cdot 10^9 (-0,7 \cdot 10^{-6})$$

$$= -6,3 \cdot 10^{-3}$$

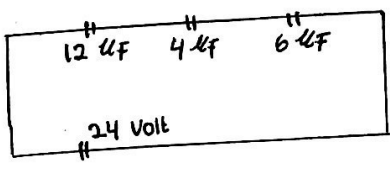
$$= -6.300 \text{ Volt} //$$

4.)



$\rightarrow C_{p1} = C_1 + C_2$   
 $= 7 \mu\text{F} + 5 \mu\text{F}$   
 $= 12 \mu\text{F}$

$C_{p2} = C_4 + C_6$   
 $= 4 \mu\text{F} + 2 \mu\text{F}$   
 $= 6 \mu\text{F}$



$\rightarrow \frac{1}{C_{\text{ek}}} = \frac{1}{12} + \frac{1}{4} + \frac{1}{6}$   
 $= \frac{2 + 6 + 4}{24}$   
 $= \frac{12}{24}$   
 $C_{\text{ek}} = \frac{24}{12}$   
 $= 2 \mu\text{F}$

$\rightarrow$  Muatan total  $= Q = C_{\text{ek}} \cdot V$   
 $= 2 \cdot 24$   
 $= 48 \mu\text{C} //$