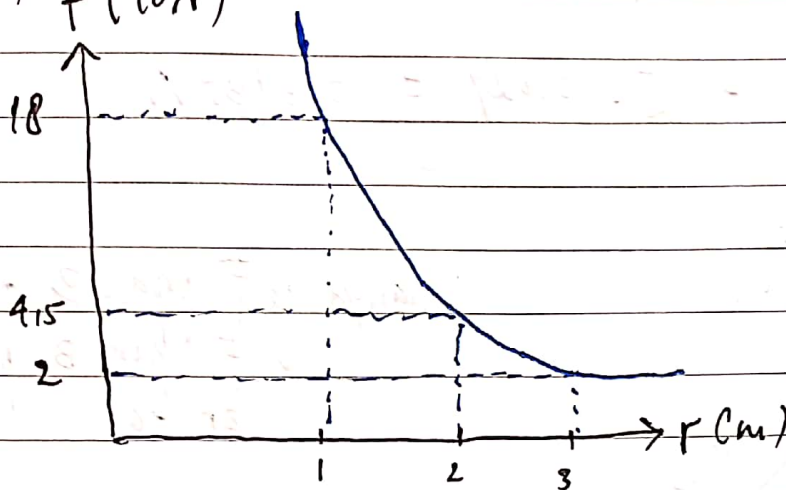


B. ESSAY $F (10^3 N)$

1.



2.

Diketahui :

$$Q_1 = 8 \mu C$$

$$Q_2 = -4 \mu C$$

$$r = 2 \text{ m}$$

Ditanya : $F \dots ?$

Jawab

$$F = \frac{k \cdot Q_1 \cdot Q_2}{r^2} = \frac{9 \cdot 10^9 \cdot 8 \cdot 10^{-6} \cdot 4 \cdot 10^{-6}}{2^2} = 72 \cdot 10^{-3} N$$

$$F = 0,072 N$$

3

Diketahui :

$$Q_1 = 24 \mu C$$

$$Q_2 = 18 \mu C$$

$$r = 12 \text{ m}$$

Dit : a. F muatan diudara

b. F muatan pada bahan $\epsilon_r = 2$

Jawab.

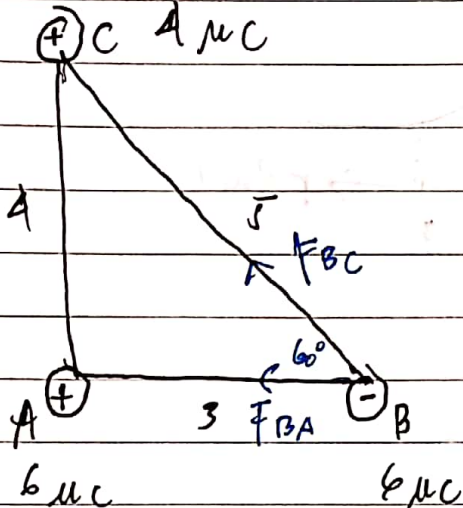
$$a. F = \frac{k \cdot Q_1 \cdot Q_2}{r^2} = \frac{9 \cdot 10^9 \cdot 24 \cdot 10^{-6} \cdot 18 \cdot 10^{-6}}{12 \cdot 12} = 27 \cdot 10^{-3} N$$

$$F = 0,027 N$$

$$b: F_{\text{bahan}} = \frac{1}{\epsilon_r} \cdot F_{\text{udara}}$$

$$F_{\text{bahan}} = \frac{1}{2} \cdot 0,027 = 0,0135 \text{ N}$$

4. Diketahui:



Ditanya: a. F pada B di udara
b. F pada B. pada bahan
 $\epsilon_r = 6$

Jawab. a. F_B di udara

$$F = K \frac{Q_B \cdot Q_A}{r_{BA}^2}$$

$$F_{BA} = g \cdot \frac{6 \cdot 10^{-9} \cdot 4 \cdot 10^{-6}}{5^2}$$

$$F_{BA} = 36 \times 10^{-3} \text{ N}$$

$$F_{BC} = K \frac{Q_B \cdot Q_C}{r_{BC}^2}$$

$$F_{BC} = g \cdot \frac{6 \cdot 10^{-9} \cdot 4 \cdot 10^{-6}}{5^2}$$

$$F_{BC} = 8,64 \cdot 10^{-3} \text{ N}$$

$$F_B = \sqrt{F_{BA}^2 + F_{BC}^2 + 2 F_{BA} \cdot F_{BC} \cdot \cos 60}$$

$$F_B = \sqrt{(36 \cdot 10^{-3})^2 + (8,64 \cdot 10^{-3})^2 + 2 \cdot 36 \cdot 10^{-3} \cdot 8,64 \cdot 10^{-3} \cdot \frac{1}{2}}$$

$$F_B = \sqrt{1296 \cdot 10^{-6} + 74,65 \cdot 10^{-6} + 311,04 \cdot 10^{-6}}$$

$$F_B = \sqrt{1681,69 \cdot 10^{-6}} = 41 \times 10^{-3} \text{ N} = 0,041 \text{ N}$$