

UTS

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- ① B. The object has the lack of electron.
Benda dapat disebut bermuatan positif jika benda tersebut kekurangan elektron

② Dik: $r_1 = 2 \text{ m}$ Jawab: $F_1 = k \frac{Q_1 Q_2}{r_1^2}$
 $r_2 = 2 r_1$ $F_2 = k \frac{Q_1 Q_2}{r_2^2}$
 $= 2 \cdot 2 \text{ m} = 4 \text{ m}$

Dit: $F_2 = \dots?$

Jawaban: E. 0,25

$$\frac{F_1}{F_2} = \frac{r_2^2}{r_1^2}$$

$$\frac{F_1}{F_2} = \frac{4^2}{2^2}$$

$$\frac{F_1}{F_2} = \frac{16}{4}$$

$$\frac{F_1}{F_2} = \frac{4}{1} \Rightarrow F_2 = \frac{1}{4} F_1$$

③ Dik: $Q_1 = -9 \mu\text{C} = 9 \times 10^{-6} \text{ C}$ Jawab:

$Q_2 = +6 \mu\text{C} = 6 \times 10^{-6} \text{ C}$ $F = k \frac{Q_1 Q_2}{r^2}$

$r = 3 \text{ m}$

$k = 9 \cdot 10^9 \text{ N m}^2 \text{ C}^{-2}$

Dit: $F = ?$

$$= 9 \cdot 10^9 \text{ N m}^2 \text{ C}^{-2} \cdot \frac{9 \cdot 10^{-6} \text{ C} \cdot 6 \cdot 10^{-6} \text{ C}}{(3 \text{ m})^2}$$

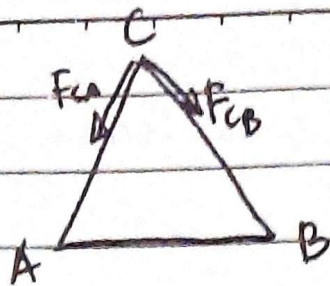
$$= \frac{9 \cdot 10^9 \cdot 9 \cdot 10^{-6} \cdot 6 \cdot 10^{-6}}{9}$$

Jawaban: A. 0,054 N

$$= 54 \times 10^{-3} \text{ N}$$

$$= 0,054 \text{ N}$$

4



3 muatan pada Δ sama sisi

$$F_C = \sqrt{F_{AC}^2 + F_{BC}^2 + 2 F_{AC} F_{BC} \cos 60}$$

$$= \sqrt{F^2 + F^2 + 2 \cdot F \cdot F \cdot \frac{1}{2}}$$

Jawaban :

E. $F\sqrt{3}$

$$= \sqrt{2F^2 + F^2}$$

$$= \sqrt{3F^2}$$

$$= F\sqrt{3}$$

5 Dik: $Q_1 = 24 \text{ nC} = 24 \times 10^{-6} \text{ C}$

$Q_2 = 20 \text{ nC} = 20 \times 10^{-6} \text{ C} = 2 \times 10^{-5} \text{ C}$

$r = 12 \text{ cm} = 0,12 \text{ m} = 12 \times 10^{-2} \text{ m}$

$\epsilon = 3$

Dit: $\neq \dots ?$

Jawaban: C. 100 N

Jawab:

$$F = \frac{k}{\epsilon} \times \frac{Q_1 \cdot Q_2}{r^2}$$

$$= \frac{9 \times 10^9}{3} \times \frac{(2 \times 10^{-5}) (24 \times 10^{-6})}{(12 \times 10^{-2})^2}$$

$$= 3 \cdot 10^9 \times \frac{(2 \times 10^{-5}) (24 \times 10^{-6})}{144 \times 10^{-4}}$$

$$= 100 \text{ N}$$

⑥ $Q_1 = -9 \mu C = -9 \times 10^{-6} C$ Dtt: $F \dots ?$

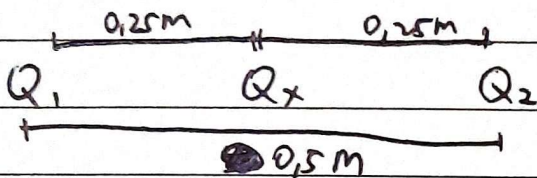
$Q_2 = -4 \mu C = -4 \times 10^{-6} C$ Arah $\dots ?$

$r_{12} = 50 \text{ cm} = 0,5 \text{ m}$

$Q_x = +5 \mu C = 5 \times 10^{-6} C$

$r_{1x} = 0,25 \text{ m}$

$r_{2x} = 0,25 \text{ m}$



Jawab:

$F_1 = \text{gaya antara } Q_1 - Q_x$ $F_2 = \text{gaya antara } Q_2 - Q_x$

$F_1 = k \frac{Q_1 \cdot Q_x}{r_{1x}^2}$

$F_2 = k \frac{Q_2 \cdot Q_x}{r_{2x}^2}$

$= 9 \times 10^9 \frac{9 \cdot 10^{-6} \cdot 5 \cdot 10^{-6}}{(0,25)^2}$

$= 9 \times 10^9 \frac{5 \cdot 10^{-6} \cdot 4 \cdot 10^{-6}}{(0,25)^2}$

$= \frac{9 \times 10^9 \cdot 45 \cdot 10^{-12}}{0,0625}$

$= \frac{9 \cdot 10^9 \cdot 20 \cdot 10^{-12}}{0,0625}$

$= \frac{405 \cdot 10^{-3}}{625 \cdot 10^{-4}}$

$= \frac{180 \cdot 10^{-3}}{625 \cdot 10^{-4}}$

$= 6,48 \text{ N}$

$= 2,88 \text{ N}$

$F_{Q_x} = 6,48 \text{ N} - 2,88 \text{ N}$

$= 3,6 \text{ N}$

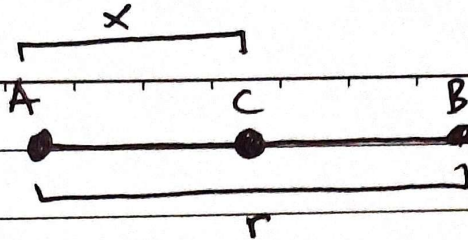
arah ke kiri (mendekati Q_1)

Jawaban: B. 3,6 N move to left

No. _____

Date . . .

⑧ $Q_A = -2 \mu C = -2 \times 10^{-6} C$
 $Q_B = -8 \mu C = -8 \times 10^{-6} C$
 $Q_C = +3 \mu C = 3 \times 10^{-6} C$



Agar Q_C tidak terpengaruh gaya coulomb:

$$F_{CA} = F_{CB}$$

$$\cancel{k} \frac{\cancel{Q_C} \cdot Q_A}{x^2} = \cancel{k} \frac{\cancel{Q_C} \cdot Q_B}{(r-x)^2}$$

$$\frac{Q_A}{x^2} = \frac{Q_B}{(r-x)^2}$$

$$\frac{2 \times 10^{-6}}{x^2} = \frac{8 \times 10^{-6}}{(r-x)^2}$$

$$\frac{1}{x^2} = \frac{4}{(r-x)^2}$$