

1. $m = 4 \text{ kg}$

$v_i = 2 \text{ m/s}$

$F = 8 \text{ N}$

$\Delta t = 5 \text{ s}$

$p_2 = ?$

$$F = \frac{\Delta p}{\Delta t} = \frac{p_f - p_i}{\Delta t}$$

$$8 = \frac{p_f - 8}{5}$$

$$40 = p_f - 8$$

$$p_f = 40 + 8 = 48 \text{ kg.m/s}$$

2. $I = \frac{\sum \epsilon}{\sum R}$

$$5 = \frac{\sum \epsilon}{17}$$

$$\sum \epsilon = 85$$

$$R = \frac{20 \times 30}{20 + 30} = 12$$

$$R_{eq} = 12 + 4 + 1 = 17$$

قراءة المولتيتر $V = \epsilon - Ir$
 $= 85 - 5 \times 1$
 $= 80$

3. $v = 4 \times 10^5$

$B = 0.1$

$v_2 = 2(4 \times 10^5)$

$m = 1.67 \times 10^{-27}$

$q = 1.6 \times 10^{-19}$

$$T = \frac{2\pi m}{qB} = 6.5 \times 10^{-7}$$

٢- مسألة الثاني

المسألة الأولى

ج - سلك من النحاس طوله 100 m مقاومته $(1.7 \times 10^{-8} \Omega \cdot m)$ وقطره 2mm $(n_e = 8.5 \times 10^{22} e/cm^3)$ واثم توصلا مع مصدر جهد 50 فولت

١- R

٢- V_d

٣- J

$$L = 100 m$$

$$\rho = 1.7 \times 10^{-8}$$

$$r = 1 \times 10^{-3}$$

$$n_e = 8.5 \times 10^{22} \frac{e}{cm^3} = \frac{8.5 \times 10^{22}}{10^{-6}} = 8.5 \times 10^{28} e/m^3$$

$$A = \pi r^2 = \pi (1 \times 10^{-3})^2 = \pi \times 10^{-6}$$

$$1. R = \frac{\rho L}{A} = \frac{(1.7 \times 10^{-8})(100)}{\pi \times 10^{-6}} = 0.54 \Omega$$

$$2. I = q_e n_e V_d A$$

$$\frac{V}{R} = q_e n_e V_d A$$

$$V_d = \frac{V}{q_e n_e A R} = \frac{50}{(1.6 \times 10^{-19})(8.5 \times 10^{28})(\pi \times 10^{-6})(0.54)} = 2.1 \times 10^{-3}$$

$$3. J = \frac{I}{A} = \frac{V}{R A} = \frac{50}{0.54 (\pi \times 10^{-6})} = 2.94 \times 10^7$$

٢. معاد الثاني

السؤال الثاني :

١-

$$m_1 = 4 \text{ kg}$$

$$V_{1i} = 100 \text{ m/s}$$

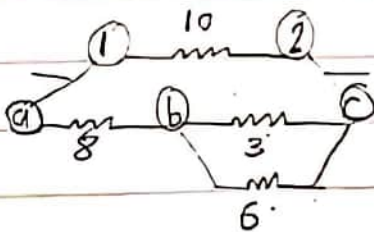
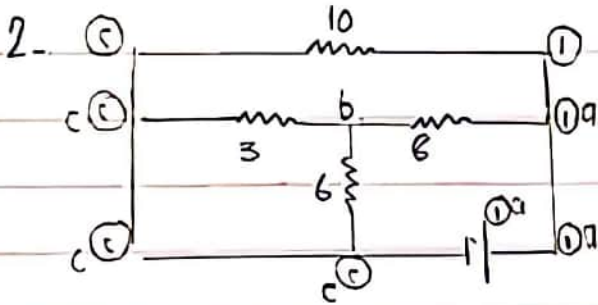
$$V_{1i} = 0$$

$$m_2 = 500 \text{ kg}$$

$$V_{2i} = 0$$

$$V_{2f} = ?$$

$$\begin{aligned} \Sigma P_i &= \Sigma P_f \\ 0 &= 4 \times 100 + 500 \times V_{2f} \\ \frac{-400}{500} &= \frac{500 V_{2f}}{500} \\ V_{2f} &= -0.8 \end{aligned}$$



(3)

$$\begin{aligned} R' &= \frac{3 \times 6}{3+6} = 2 \\ R'' &= 2 + 8 = 10 \\ R_{eq} &= \frac{10 \times 10}{10+10} = 5 \Omega \end{aligned}$$

3- $m_1 = m$

$m_2 = m$

$V_{1i} = V$

$V_{2i} = 0$

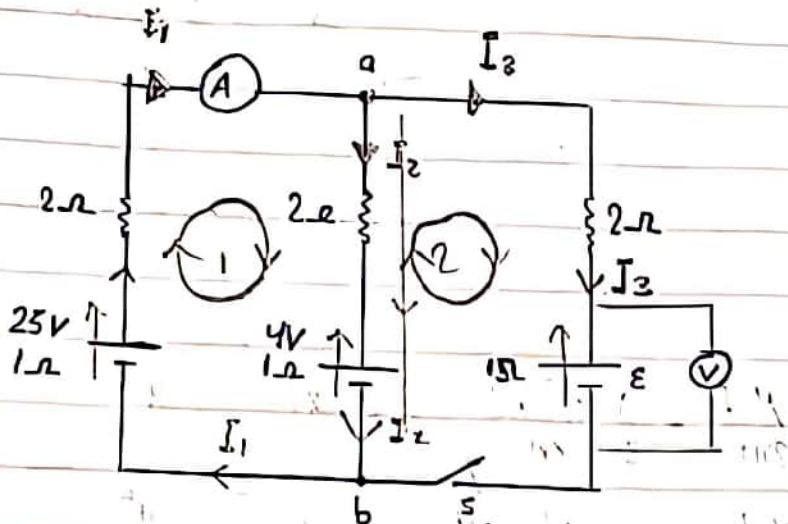
V_f

$$\begin{aligned} \Sigma P_i &= \Sigma P_f \\ m_1 V + 0 &= 2m V_f \\ V_f &= \frac{1}{2} V \end{aligned}$$

$$\begin{aligned} \Delta K &= \Sigma K_f - \Sigma K_i \\ &= \frac{1}{2} (m_1 + m_2) V_f^2 - \left[\frac{1}{2} m V^2 + 0 \right] \\ &= \frac{1}{4} m V^2 - \frac{1}{4} m V^2 \\ &= -\frac{1}{4} m V^2 \end{aligned}$$

٢٠. مصدر التناوب

السؤال الثاني ب



١. قراءة الأميتر قبل انغلاق (S)

$$I = \frac{\sum \mathcal{E}}{\sum R} = \frac{25 - 4}{6} = 3.5 \text{ A}$$

٢. عند الانغلاق

$$\begin{aligned} I_1 &= I_2 + I_3 \\ 4 \text{ A} &= I_2 + I_3 \\ I_3 &= 4 - I_2 \end{aligned}$$

$$\sum \Delta V \textcircled{1} = 0$$

$$25 - 3 \times 4 - 3I_2 - 4 = 0$$

$$21 - 12 = 3I_2$$

$$9 = 3I_2$$

$$I_2 = 3 \text{ A}$$

$$\therefore I_3 = 4 - 3 = 1 \text{ A}$$

قراءة الفولتميتر

$$V = \mathcal{E} + Ir$$

$$= 10 + 1 \times 1$$

$$= 11 \text{ volt}$$

$$\sum \Delta V \textcircled{2} = 0$$

$$-3 \times 3 - \mathcal{E} + 4 + 3 \times 3 = 0$$

$$-3 + 4 + 9 = \mathcal{E}$$

$$\mathcal{E} = 10 \text{ volt}$$

$$V_{ab} = -\sum \Delta V_{ab}$$

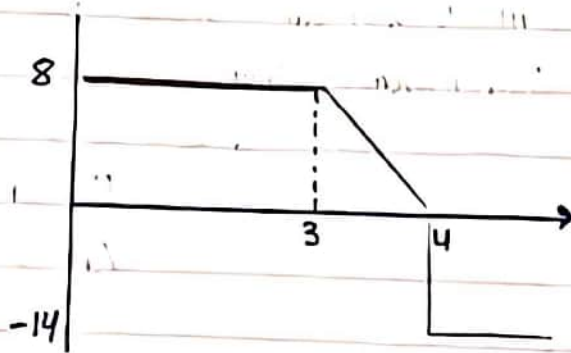
$$= -(-3 \times 3 - 4)$$

$$= -(-9 - 4)$$

$$= 13 \text{ volt}$$

السؤال الثاني

٢- محمد الثاني



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

$$v_i = 7 \text{ m/s}$$

١-

$$I_{4s} = m(v_{4s} - v_i)$$

$$(8 \times 3) + \left(\frac{1}{2} \times 8\right) = 2(v_{4s} - 7)$$

$$28 = 2(v_{4s} - 7)$$

$$14 + 7 = v_{4s}$$

$$v_{4s} = 21 \text{ m/s}$$

٢-

توقف الجسم

$$v_{4s} = 0$$

$$I = m(v_{4s} - v_i)$$

$$= 2(0 - 7)$$

$$= -14 \text{ N·s}$$

مستطيل + مساحة شبه منحرف I

$$-14 = 28 + -14(t - 4)$$

$$-14 - 28 = -14(t - 4)$$

$$-42 = -14(t - 4)$$

$$t = 7 \text{ s}$$

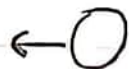
٣-

$$\sum F = \frac{I}{\Delta t} = \frac{-14}{7} = -2 \text{ N}$$

السؤال الثالث :

٢- معمد النابج

١-



$$m_1 = 2 \text{ kg}$$

$$v_{i1} = -4 \text{ m/s}$$

$$v_{f1} = 2 \text{ m/s}$$

$$I = m(v_f - v_i)$$

$$= 2(2 - (-4))$$

$$= 12 \text{ N}\cdot\text{s}$$

2-

$$l_1 = 3$$

$$l_2 = 2$$

$$B_1 : B_2$$

$$\frac{\mu_0 I_1 N}{l_1} : \frac{\mu_0 I_2 N}{l_2}$$

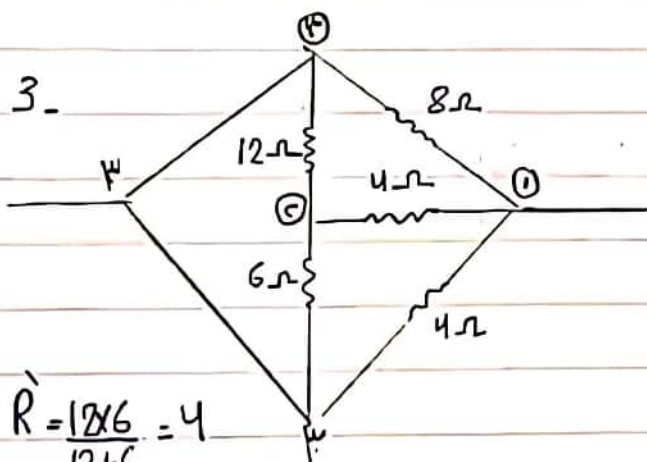
$$\frac{1}{3}$$

$$: \frac{1}{2}$$

$$2$$

$$: 3$$

3-

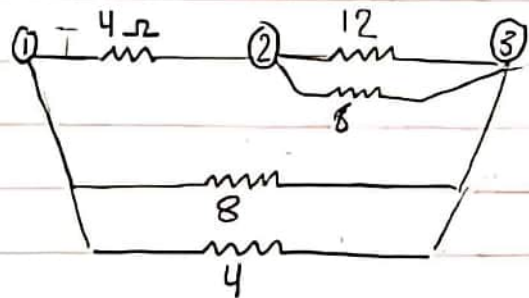


$$R' = \frac{12 \times 6}{12 + 6} = 4$$

$$R'' = 4 + 4 = 8$$

$$\frac{1}{R_{eq}} = \frac{1}{8} + \frac{1}{4} + \frac{1}{8} = \frac{1}{2}$$

$$R_{eq} = 2 \Omega$$



حزوني $L = 2\pi \times 10^{-2}$

$N = 25$

(البعد) $L = 0,1 \text{ m}$

$q = -1 \times 10^{-6}$

$v = 2 \times 10^6 \text{ y}^+$

لورنتز $F = 5 \times 10^{-3}$

حزوني $I = ?$

لورنتز $F (5 \times 10^{-3})$

x^-

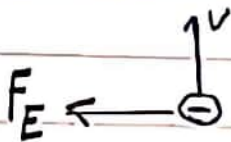
$F_E = qE$

$= q \frac{\Delta V}{L}$

$= 5 \times 10^{-3}$

z^-

$F_B = qvB_T \sin \theta$



لورنتز $F^2 = F_E^2 + F_B^2$

$F_B = \sqrt{F^2 - F_E^2}$

$F_B = 4 \times 10^{-3} \text{ z}^-$

$F_B = qvB_T \sin 90$

$B_T = \frac{F_B}{qv \sin 90} = \frac{4 \times 10^{-3}}{(1 \times 10^{-6})(2 \times 10^6)} = 2 \times 10^{-3} \text{ T}$

$\frac{\mu_0 IN}{L} = 2 \times 10^{-3}$

$I = 4 \text{ A}$

1- $m_1 = m$ $m_2 = 2m$ $v_f = ?$
 $v_{1i} = v$ $v_{2i} = 0$

$$\begin{aligned} \Sigma p_i &= \Sigma p_f \\ (mv) + 0 &= (m_1 + m_2) v_f \\ mv &= 3mv_f \\ v_f &= \frac{1}{3}v \end{aligned}$$

2. 

3- $P = I^2 R$
 $20 = I^2 5$
 $4 = I^2$
 $I = 2A$

$$I = \frac{\Sigma \epsilon}{\Sigma R}$$

$$2 = \frac{\epsilon_1 - 24}{9}$$

$$18 = \epsilon_1 - 24$$

$$\begin{aligned} \epsilon_2 &= 24 + 18 \\ &= 42 \end{aligned}$$

بمسألة الإلكترون بنفس اتجاه سرعته

1- E
 B



F_E

$$F_B = qvB \sin 0 = 0$$

2- W_1

K_1

$W_2 = 2W_1$

$K_2 = ?$

$$\frac{K_1}{K_2} = \frac{\frac{1}{2} I_1 W_1^2}{\frac{1}{2} I_2 (4W_1)^2} = \frac{1}{4}$$

$$K_2 = 4K_1$$

نستخدم المجال

3- $R = \pi \times 10^{-2}$

$I = 3A$

$I = ?$

$r = 0.1 m$

B_1 سلك

B_2

$$\frac{\mu_0 I}{2\pi r}$$

$$= \frac{\mu_0 I N}{2R}$$

$$\frac{I}{\frac{1}{4}\pi (0.1)}$$

$$= \frac{3 \times 1}{8 \times \pi \times 10^{-2}}$$

$$I = 30 A$$

30 أمبير نحو يسار

1- حث

2-

$$B_{T(1)} \rightarrow \begin{aligned} B_1 &= \frac{\mu_0 I}{2\pi r} = \frac{4\pi \times 10^{-7} \times 2}{2\pi (16 \times 10^{-2})} = 25 \times 10^{-6} \text{ T} \\ B_2 &= \frac{\mu_0 I}{2\pi r} = \frac{4\pi \times 10^{-7} \times 4}{2\pi (6 \times 10^{-2})} = 1,3 \times 10^{-5} \text{ T} \end{aligned}$$

$$B_T = B_2 - B_1 = 1,08 \times 10^{-5} \text{ T}$$

3- $l = 1 \text{ m}$

$$m_1 = m_2 = 5 \text{ kg}$$

$$\begin{aligned} I &= mr^2 + mr^2 \\ &= 5(0,5)^2 + 5(0,5)^2 \\ &= 1,25 + 1,25 \\ &= 2,5 \end{aligned}$$



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