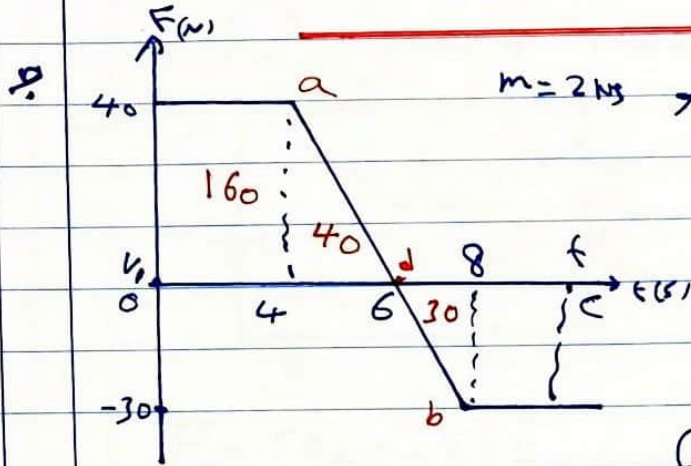


الاجابة التجريبية [2025/4/16] الكلية الاخلاص + راهدان ماريوسف

- س 1) $\vec{I} = \vec{P}_2 - \vec{P}_1 \Rightarrow 10 = 6 - P_1 \Rightarrow P_1 = -4$ (ب)
 2) $\sum P_i = \sum P_f \Rightarrow 0 = P_2 - P_1 \Rightarrow P_2 = P_1 \Rightarrow 1:1$ (د)
 3) $I \Rightarrow \omega \Rightarrow \sum L_i = \sum L_f \Rightarrow \omega = 2\omega_0 \Rightarrow \omega = 4 \text{ rad/s}$ (ج)



$$m = 2 \text{ kg} \Rightarrow V = 20 \text{ m/s}$$

الاجابة = الاجابة =

$$I = 4 \times 40 + \frac{1}{2} \times 2 \times 40 = \frac{1}{2} \times 2 \times 30 = 170$$

$$I = \Delta P$$

$$\Delta P = m(V_f - V_i)$$

$$160 = 2(V_f - 20) \Rightarrow V_f = 100 \text{ m/s}$$

$$170 = 2(V_b - 20) \Rightarrow V_b = 105 \text{ m/s}$$

$$1) \Delta K = K_b - K_a = \frac{1}{2} m(V_b^2 - V_a^2) = \frac{1}{2} \times 2 \times (105^2 - 100^2) =$$

$$\Delta K = 1025 \text{ J}$$

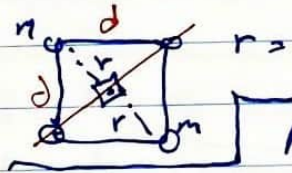
$$2) V \Rightarrow I = \Delta P \Rightarrow 200 = 2(V_f - 20) \Rightarrow V_f = 120 \text{ m/s}$$

$$V_c = \frac{120}{2} = 60 \text{ m/s} \Rightarrow I = \Delta P \Rightarrow \Delta P = m(V_c - V_i)$$

$$170 - (t-8) \times 30 = 2(60 - 20) \Rightarrow t = 11 \text{ s}$$

س 1) (ج) اذا كتبنا تزداد المقارنة $P = \frac{V^2}{R}$, $I = \frac{V}{R}$

$$2) n \Rightarrow r = \frac{v}{\omega} = \frac{v}{\frac{2\pi}{T}} \Rightarrow I = 2 \times m \times \left(\frac{v}{2}\right)^2 = m d^2$$



$$A_2 = \frac{1}{4} A_1 \Rightarrow \pi R_2^2 = \frac{1}{4} \pi R_1^2 \Rightarrow R_2 = \frac{1}{2} R_1$$

$$3) N_1 (2\pi R_1) = N_2 (2\pi R_2) \Rightarrow N_1 R_1 = N_2 R_2 \Rightarrow N_2 = 2N_1$$

$$\frac{B_2}{B_1} = \frac{\frac{\mu_0 N_2 I}{2R_2}}{\frac{\mu_0 N_1 I}{2R_1}} = \frac{R_1 N_2}{R_2 N_1} = \frac{R_1 \times 2N_1}{\frac{R_1}{2} \times N_1} = 4 \Rightarrow (B_1 : B_2) = (1 : 4)$$

$$4) \Delta K = F \cdot d \Rightarrow \frac{1}{2} m v^2 = qVB \Rightarrow r = \frac{mv}{qB} \Rightarrow T = \frac{2\pi r}{v} = \frac{2\pi m}{qB} \Rightarrow f = \frac{1}{T} = \frac{qB}{2\pi m}$$

$$5) \tau = I \alpha = I \frac{\Delta \omega}{\Delta t} = \Delta \left(\frac{I \omega}{\Delta t} \right) \Rightarrow \tau = \frac{\Delta L}{\Delta t}$$

$$6) L = \mu_0 N^2 A \Rightarrow \mu_0, N^2, A \text{ (تناسب طردي)}$$

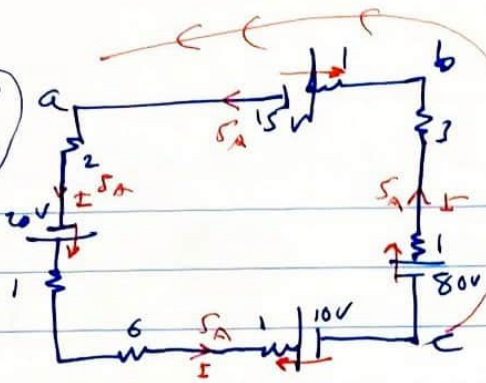
7) عند القطب الدائم الحثية في دائرة او ملف تتناسب طردياً مع العدد الزاوي لللفز Φ

$$\omega = F \Delta x = -I L B \Delta x = -I B \Delta A \Rightarrow \omega = -I \Delta \Phi$$

$$-I \Delta \Phi = \epsilon_{in} I \Rightarrow \epsilon_{in} = -\frac{\Delta \Phi}{\Delta t} \Rightarrow \epsilon_{in} = -N \frac{\Delta \Phi}{\Delta t}$$

2

المشغل
مستحق

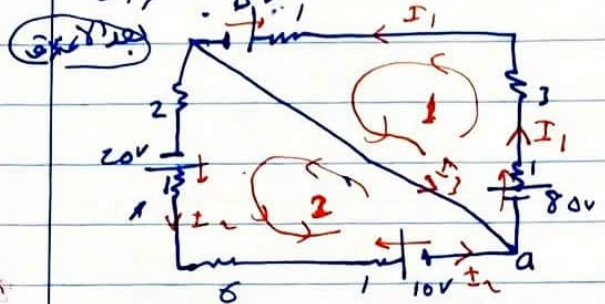


$$I = \frac{\sum \mathcal{E}}{\sum R} = \frac{(80+20) - (10+15)}{6+1+1+2+1+2+1} = \frac{75}{15} = 5A$$

$$P = \sum \mathcal{E}I + \sum V_{Ca}$$

$$V_{Ca} = -\sum \mathcal{E}V = -(5(1+3+1) + 80 - 15) = -40$$

$$P = 80 \times 5 + -40 \times 5 = 200 \text{ watt}$$



بعد اعلان النتائج
نفسه في كل ارجاء

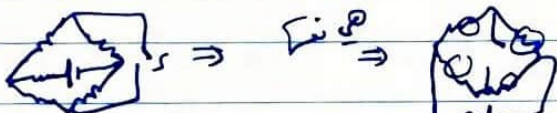
$$I_2 + I_3 = I_1$$

$$1) 0 = \sum \mathcal{E}V \Rightarrow 0 = 80 + 5I_1 - 15 \Rightarrow I_1 = 13A$$

$$2) 0 = \sum \mathcal{E}V \Rightarrow 0 = 20 + 10I_2 - 10 \Rightarrow I_2 = 1A$$

$$P = \sum R I^2 + \sum \mathcal{E}I = (1+3+1) \times 13^2 + 15 \times 13 + (2+1+6+1) \times 1^2 + 10 \times 1 = 1060 \text{ watt}$$

لا يتأثر
اي صياح



$$2) \mathcal{E}_{in} = \mathcal{E}_{out} \Rightarrow 10 = \frac{\mathcal{E}}{R} \Rightarrow 15 = \frac{\mathcal{E}}{4} \Rightarrow \mathcal{E} = 60V / 10 \Rightarrow \frac{60}{10} \Rightarrow 6H$$

$$\mathcal{E} = L \frac{dI}{dt} + RI \Rightarrow 60 = 6x + 4x \Rightarrow x = 6 = I = \frac{dI}{dt} \Rightarrow$$

$$P = L \frac{dI}{dt} I = 6 \times 6 \times 6 = 216 \text{ watt}$$

$$3) \frac{1}{15} + \frac{1}{5} + \frac{1}{5} = \frac{1}{2} \Rightarrow R = 10 \Rightarrow R, 2R \rightarrow \frac{2}{3}R, \frac{2}{3}R + R = 10 \Rightarrow R = 6$$

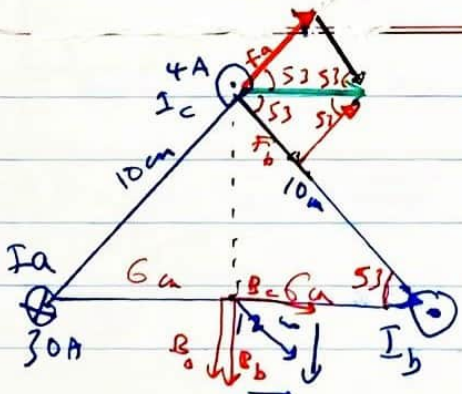
$$\mathcal{E}_p = \mathcal{E}_f \Rightarrow 16 + 40 = P_f \Rightarrow P_f = 24 \text{ kg m/s} \Rightarrow P_f = \sqrt{2(m_1 + m_2) k_f}$$

$$24 = \sqrt{2(2 + m_2) \times 36} \Rightarrow m_2 = 6 \text{ kg}$$

$$K_{ii} = \frac{P_{ii}^2}{2m} = \frac{(10)^2}{2 \times 2} = 64 \text{ J}, K_{ff} = \frac{(40)^2}{2 \times 6} = 133 \text{ J} \Rightarrow$$

$$K = (64 + 133) - (36) = 161 \text{ J}$$

2.



$$F_a = 10^{-7} \times 2I_1 I_2, 10^{-7} \times 2 \times 30 \times 4 = 24 \times 10^{-5} \text{ N/m}$$


زوايا القاعدة متساوية في مثلث الاقمار

$$F_b = 24 \times 10^{-5} = 10^{-7} \times 2 \times 4 \times I_b \Rightarrow I_b = 30A \text{ } \leftarrow B$$

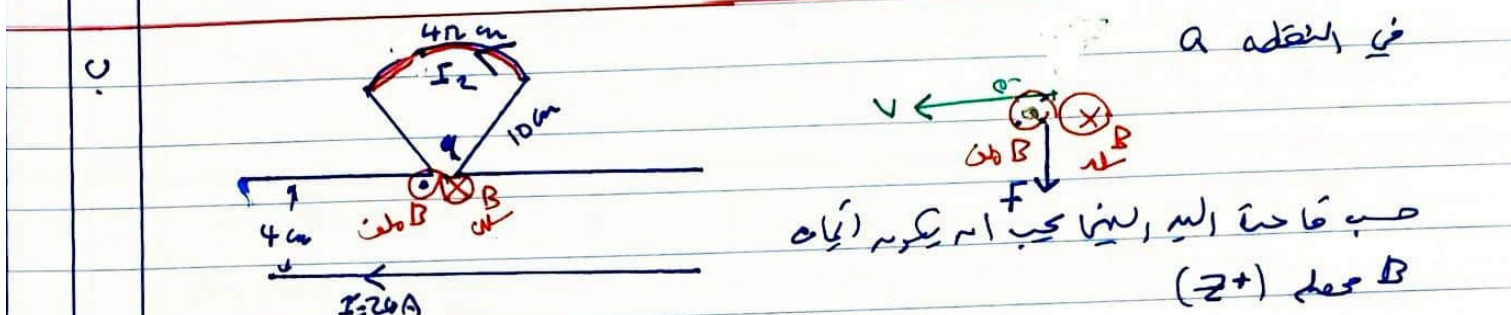
$$B = 157 \frac{2\pi}{r}$$

$$B = \sqrt{B_a^2 + B_b^2} + B_c$$

1) $J = \frac{KS \cdot \omega^2}{\omega^2} \Rightarrow K S \cdot m^2 = J \cdot \omega^2 \Rightarrow \frac{K S m^2}{\omega^2} = \frac{J \cdot \omega^2}{\omega^2} = \frac{J}{\omega^2} = H$ (المحاور) $E = \frac{1}{2} 4 \cdot 2^2$

2)  $B = \frac{\mu_0 I N}{L}$ في اتجاه اليد اليمنى فإشارة المجال في مركزه

3) $V = \mathcal{E} - r_1 I = 0 \Rightarrow \mathcal{E} = r_1 I \Rightarrow \mathcal{E} = \eta \frac{2\mathcal{E}}{\eta + \eta_2 + R} \Rightarrow R = \eta_1 - \eta_2 = 5 - 3 = 2 \Omega$



$B = 10^{-7} \frac{2I}{r} = \frac{10^{-7} \times 2 \times 20}{4 \times 10^{-2}} = 10 \times 10^{-5} T$

$19.2 \times 10^{-19} = 1.6 \times 10^{-19} \times 2 \times 10^5 \times B \Rightarrow B = 6 \times 10^{-5} T$

$B = B_1 - B_2 \Rightarrow B = (10 + 6) \times 10^{-5} = 16 \times 10^{-5} T$

عدد اللفات = $\frac{\text{طول الأسلاك}}{\text{الحجم}} = \frac{S}{2\pi r} = \frac{4\pi}{2\pi \times 10} = 0.2$ لفة

$B = \frac{\mu_0 I N}{2r} \Rightarrow 16 \times 10^{-5} = \frac{4\pi \times 10^{-7} \times I_2 \times 0.2}{2 \times 10 \times 10^{-2}} \Rightarrow I = \frac{400}{\pi} A$ عكس اتجاه التيار

2. $\Phi = \frac{60}{100} \Phi_{max} \Rightarrow BA \cos \alpha = 0.6 BA \Rightarrow \alpha = 53^\circ$

$\mathcal{E}_{in} = \mathcal{E}_{max} \sin \theta \Rightarrow 80 V = \mathcal{E}_{max} \times 0.8 \Rightarrow \mathcal{E}_{max} = 100 V$

$\mathcal{E}_{max} = BA \omega$ ، $\omega = \frac{10}{0.2} \times 2\pi = 100 \pi \text{ Rad/s}$

$100 V = \Phi_{max} \times 200 \times 100 \pi \Rightarrow \Phi_{max} = 5 \times 10^{-3} Wb$

$a = \mathcal{E}_{max} = 100 V$

$b = \text{زمن دورة واحدة} \Rightarrow T = \frac{2\pi}{\omega} = \frac{2\pi}{100\pi} = 0.02 s$

$b = 0.02 \times 1.5 = 0.03 s = b$

1) $qV = \frac{1}{2} m v^2 \Rightarrow v = \sqrt{\frac{2qV}{m}}$ ، $d = 2 \times \frac{2mvr}{qB} \Rightarrow d = \sqrt{\frac{8mvr}{qB^2}}$

2)  نتيجة E و v هي $y +$ ، $y -$ اتجاه E ، $y -$ اتجاه v ، $y -$ اتجاه B

$d = 2 \times 20 = 40$

3) $\mathcal{E} = 10^{-2} \frac{2\mathcal{E}_1 \mathcal{E}_2}{r} \Rightarrow 24 \times 10^{-2} = \frac{10^{-2} \times 2 \mathcal{E}_1 (10 - \mathcal{E}_1)}{r} \Rightarrow 24 = 10\mathcal{E}_1 - \mathcal{E}_1^2$
 $0 = \mathcal{E}_1^2 - 10\mathcal{E}_1 + 24 \Rightarrow \mathcal{E}_1 = 6 \text{ A}, \mathcal{E}_2 = 4 \text{ A}$
 $\frac{10^{-2} \times 2 \times 4}{d} = \frac{10^{-2} \times 2 \times 6}{2+d} \Rightarrow 3d = 4+2d \Rightarrow d = 4 \text{ m}$

4) $L_{in} = \mu_0 n^2 A L = 4\pi \times 10^{-7} \times 10^8 \times \frac{10}{\pi} \times 10^{-4} \times 0.4 \Rightarrow L_{in} = 16 \times 10^{-3} \text{ H}$
 $\mathcal{E}_{in} = -L_{in} \frac{\Delta \mathcal{I}}{\Delta t} = -16 \times 10^{-3} \times 0.5 = -8 \times 10^{-3} \text{ V}$
 $\frac{\Delta \mathcal{I}}{\Delta t} = \frac{\mathcal{I}_2 - \mathcal{I}_1}{\Delta t} = 0.5 \Rightarrow \frac{\mathcal{I}_2 - 0}{6} = 0.5 \Rightarrow \mathcal{I}_2 = 3 \text{ A}$
 $L_{in} = \frac{N \Phi_2}{\mathcal{I}_2} \Rightarrow 16 \times 10^{-3} = \frac{4 \times 10^3 \Phi_2}{3} \Rightarrow \Phi_2 = 12 \times 10^{-6} \text{ wb}$
 $L_{in} = \frac{N \Phi}{\mathcal{I}} \Rightarrow \frac{d\Phi}{d\mathcal{I}} = \frac{L_{in}}{N} = \frac{16 \times 10^{-3}}{4 \times 10^3} = 4 \times 10^{-6} \text{ wb/A}$

8. $L = 4d \Rightarrow d = \frac{L}{4} \Rightarrow A_1 = d^2 = \frac{L^2}{16}, L = 2\pi R \Rightarrow R = \frac{L}{2\pi}$
 $A_2 = \pi R^2 = \frac{L^2}{4\pi}, \theta_1 = 60^\circ, \theta_2 = 120^\circ$
 $\mathcal{E}_{in} = -N \frac{\Delta \Phi}{\Delta t} = -NB \left(\frac{A_2 \omega_2 - A_1 \omega_1}{\Delta t} \right)$
 $\mathcal{E}_{in} = -NB \left(\frac{\frac{L^2}{4\pi} \times \frac{1}{2} - \frac{L^2}{16} \times \frac{1}{2}}{\Delta t} \right) \Rightarrow \mathcal{E}_{in} = \frac{BL^2(4+\pi)}{16\pi}$

2) 1) $\frac{\Delta \mathcal{I}}{\Delta t} = 0 \Rightarrow \mathcal{P} = 0, V = 0 \Rightarrow$ قسمة لا تساوي صفر
 2) $L_{in} = \mu_0 n^2 AL \Rightarrow L_{in} = 4 \times 20 = 80 \text{ H}$
 3) $6v_{1i} + 0 = 6 \times \frac{-v_{1f}}{3} + m_2 v_{2f} \Rightarrow 8v_{1i} = m_2 v_{2f}$
 $v_{1i} = v_{2f} - \frac{v_{1i}}{3} \Rightarrow \frac{2}{3}v_{1i} = v_{2f} \Rightarrow m_2 = 12 \text{ kg}$

4) $\frac{R_1}{3} = \frac{12}{R_1} \Rightarrow R_1 = 6 \Omega \Rightarrow 50 = \mathcal{E}_1 - 10 \Rightarrow \mathcal{E}_1 = 60 \text{ V}, \mathcal{E}_r = 2+2=4$
 $\mathcal{E}_1 \Rightarrow I = \frac{50-30}{4} = 5 \text{ A}, \mathcal{E}_r = \frac{V}{I} = \frac{30}{5} = 6 \Omega$
 $R' = \frac{10 \times 10}{R_1 + 10} \Rightarrow \frac{R' \times 10}{R_1 + 10} = 6 \Rightarrow R' = 15 \Rightarrow R_2 = 8 \Omega$

8. $\tau = RF, \alpha = \frac{\tau}{I} = \frac{RF}{\frac{1}{2}MR^2} \Rightarrow \alpha = \frac{2F}{MR}$
 $\mathcal{E}_{ki} = \mathcal{E}L_f \Rightarrow I, \omega_{1i} + 0 = (I_1 + I_2)\omega_f \Rightarrow$
 $\frac{1}{2}MR^2 \times \frac{18F}{MR} = \left(\frac{1}{2}MR^2 + \frac{2}{5}MR^2 \right) \omega_f \Rightarrow \omega_f = \frac{10F}{MR}$
 $K = K_1 + K_2 = \frac{1}{2}I_1 \omega_{1i}^2 + \frac{1}{2}(I_1 + I_2)\omega_f^2$
 $= \frac{1}{2} \times \frac{1}{2}MR^2 \times \left(\frac{18F}{MR} \right)^2 + \frac{1}{2} \left(\frac{1}{2}MR^2 + \frac{2}{5}MR^2 \right) \times \left(\frac{10F}{MR} \right)^2 = \frac{36F^2}{M}$

سایه السایه . 4-



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