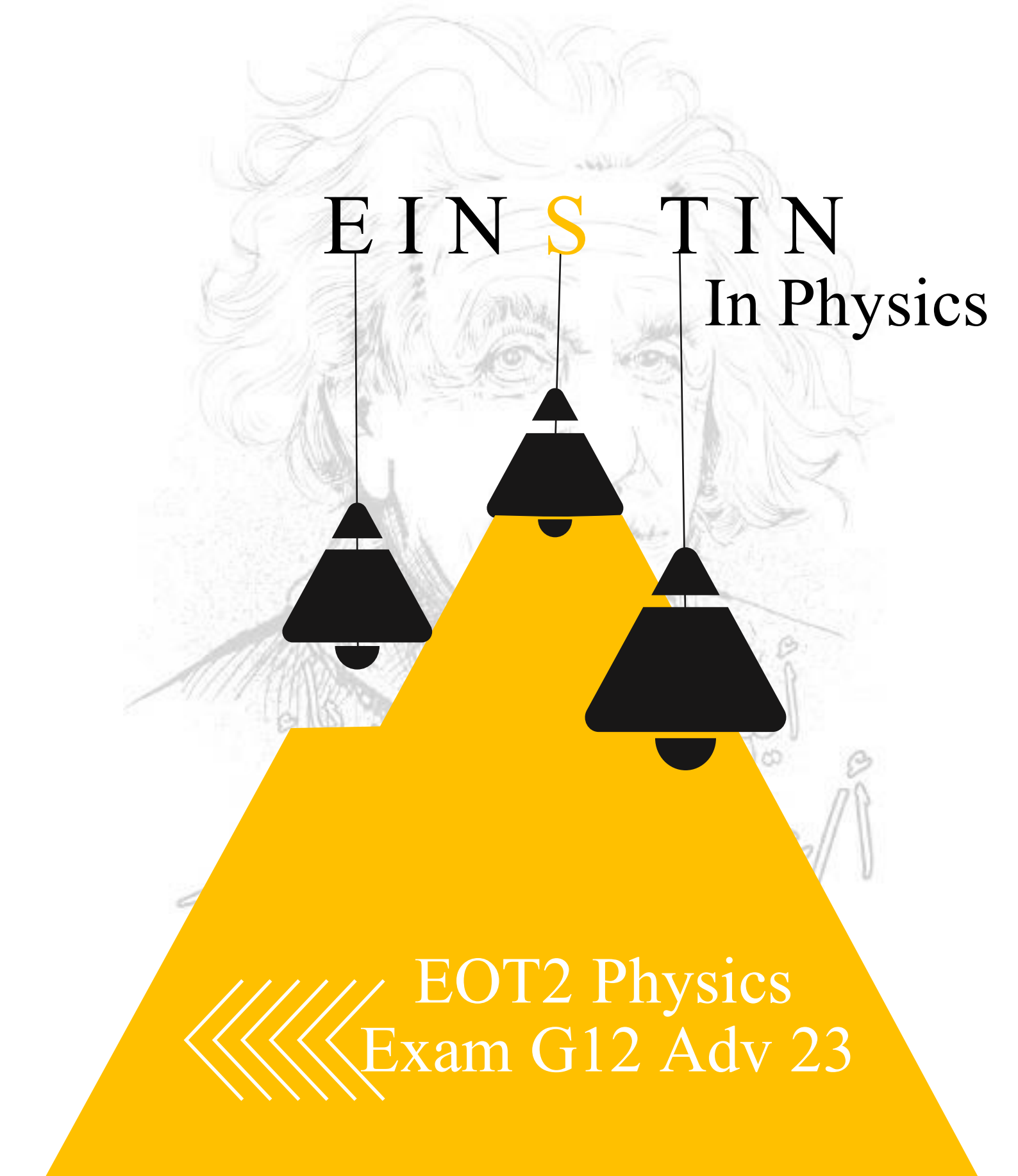
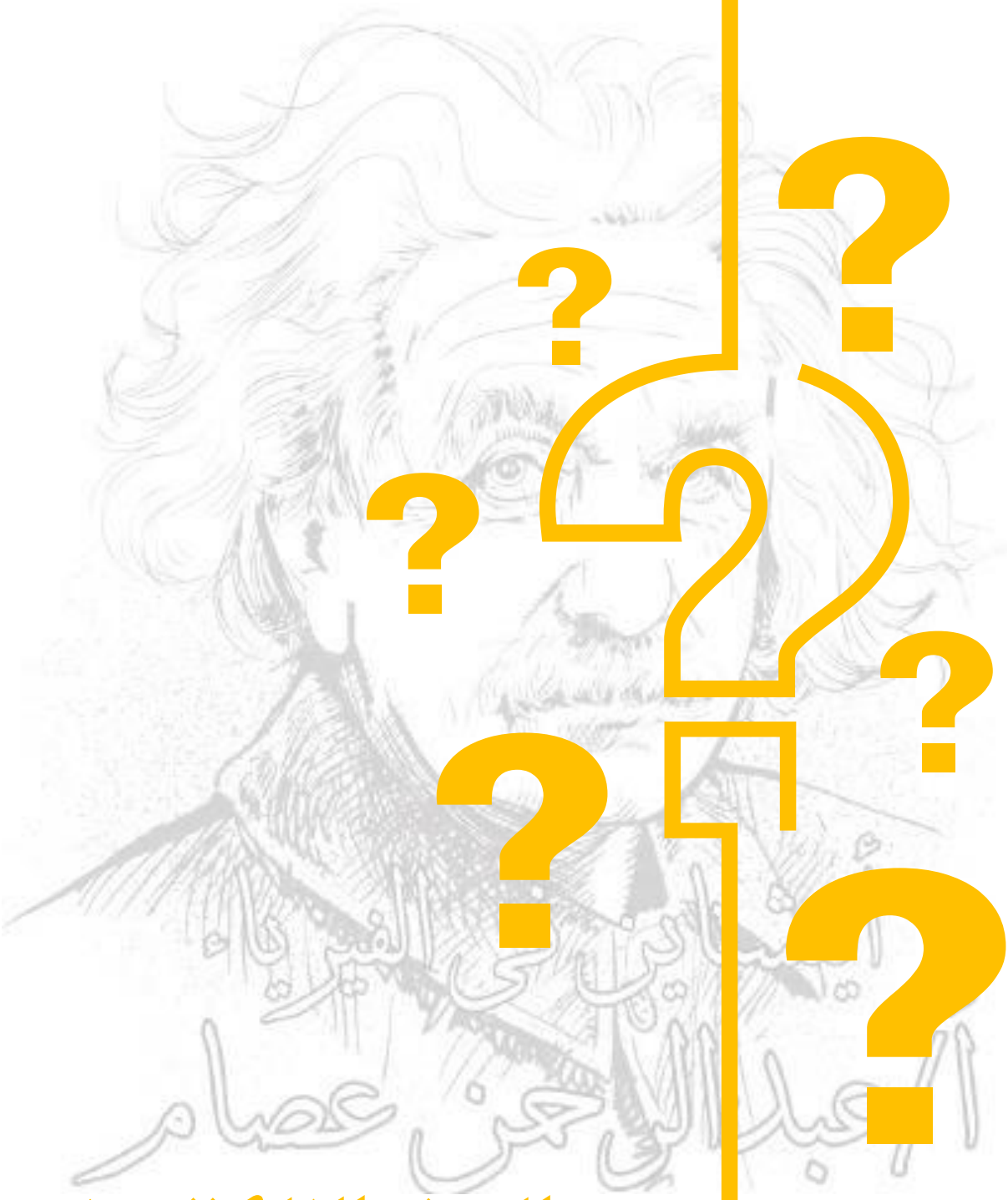
اسم الطالب: .....



EOT2 Physics
Exam G12 Adv 23

PART _1



الجزء الالكتروني

2022 – 2023

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MULTIPLE-CHOICE QUESTIONS :

Electric Current and charge :

1. *If the equation between charge and time is* $(q = 5t^2 + 7t + 9)$. *What is the current at* $t = 2.5\ s$?

ⓐ 32 mA ⓑ 9 mA ⓒ 18 mA ⓓ 42 mA

Current Density:

2. *Two wires carry the same current. If the area of the second wire is 3 times the area of the first wire, which of the following is true?*

ⓐ $J_2 = \frac{1}{9}J_1$ ⓑ $J_2 = 9J_1$ ⓒ $J_2 = \frac{1}{3}J_1$ ⓓ $J_2 = 3J_1$

Resistivity and Resistance:

If the Conductance of the wire is $0.9S$, *and there is another wire of the same material and the same length, and the radius of the second wire is* 3 *times that of the first wire, what is the Conductance of the second wire?*

ⓐ $0.3S$ ⓑ $8.1S$ ⓒ $0.1S$ ⓓ $2.7S$

Electromotive Force:

3. *Which of the following is equivalent to* $3.6\ C$?

ⓐ 1.0 *milliampere.hour* 1.0mAh ⓑ 1.0 *ampere.hour* 1.0Ah ⓒ 1.0 *ampere.second* 1.0As ⓓ 1.0 *milliampere.second* 1.0mAs

Ohm's Law:

4. *What happens when the potential difference in a cylindrical conductor increases?*

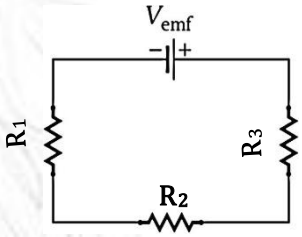
A. The current through the conducting cylinder decreases .
B. The resistance of the conducting cylinder increases .
C. The current through the conducting cylinder increases .
D. The resistance of the conducting cylinder decreases .

Internal Resistance:

5. *A 6.0 V battery with an internal resistance of 0.30 Ω is connected to a 1.20 Ω resistor. What is the electric current flowing through the circuit?*

ⓐ 5.0A ⓑ 4.0A ⓒ 20.0A ⓓ 9.0A

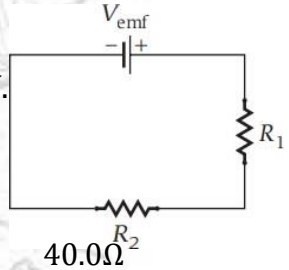
Resistors in Series:



6. *For the circuit shown in the figure, R1 = 2.0 Ω, R2 = 1.0 0Ω, R3 = 5.0 Ω, and the potential difference is 40. V. What is the current flowing through the circuit?*

ⓐ 5.0A ⓑ 8.0A ⓒ 20.0A ⓓ 40.0A

Resistors in Series:



7. *For the circuit shown in the figure, R1 = 3R2 and Vemf is 8.0 V. if a current of 0.2 A flows through the circuit What is the resistance of R1*

ⓐ 10.0Ω ⓑ 20.0Ω ⓒ 30.0Ω ⓓ 40.0Ω

Energy and Power in Electric Circuits:

8. *An electrical device with a power of (640 W) has a resistance of 10.0 Ω. What is the electromotive force needed to operate this device?*

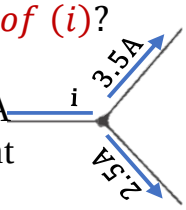
ⓐ 80V ⓑ 64V ⓒ 6.4 ⓓ 6400V

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Kirchhoff's Junction Rule :

9. *According to the figure, what is the magnitude and direction of (i)?*

ⓐ 6.0A left ⓑ 1.0A left ⓒ 6.0A right ⓓ 1.0A right



Sign Convention for Potential Changes in Analyzing Loops :

10. *when analyzing loops in electric circuits, which of the following assumption is correct for the conventions used to determine the sign of potential changes?*

ⓐ

Element	Direction of Analysis	Potential Change
R	Same as current	$+iR$
R	Opposite to current	$-iR$
V_{emv}	Same as emf	$+V_{emf}$
V_{emv}	Opposite to emf	$-V_{emf}$

ⓑ

Element	Direction of Analysis	Potential Change
R	Same as current	$-iR$
R	Opposite to current	$+iR$
V_{emv}	Same as emf	$-V_{emf}$
V_{emv}	Opposite to emf	$+V_{emf}$

ⓒ

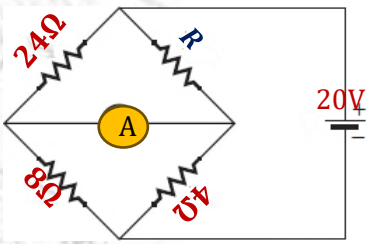
Element	Direction of Analysis	Potential Change
R	Same as current	$-iR$
R	Opposite to current	$+iR$
V_{emv}	Same as emf	$+V_{emf}$
V_{emv}	Opposite to emf	$-V_{emf}$

ⓓ

Element	Direction of Analysis	Potential Change
R	Same as current	$+iR$
R	Opposite to current	$-iR$
V_{emv}	Same as emf	$-V_{emf}$
V_{emv}	Opposite to emf	$+V_{emf}$

Resistors in Wheatstone Bridge :

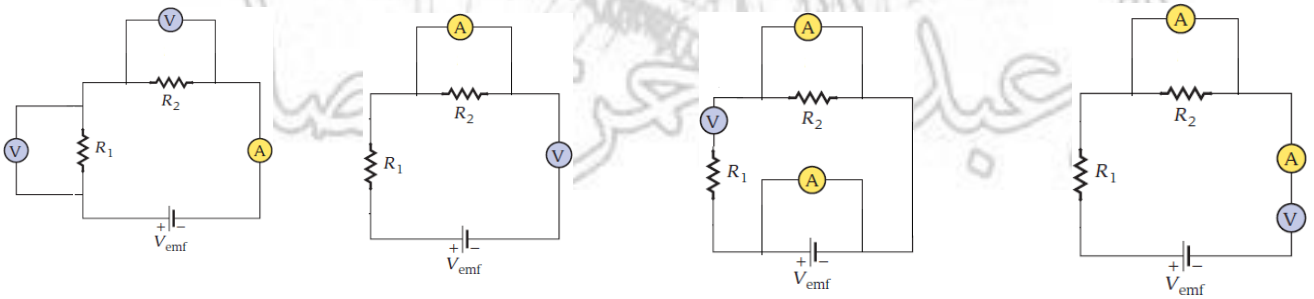
11. *If the reading of the sensitive ammeter (A) is zero what is the magnitude of R?*



ⓐ **8.0Ω** ⓑ **24.0Ω** ⓒ **12.0Ω** ⓓ **4.0Ω**

Ammeters and Voltmeters in circuits

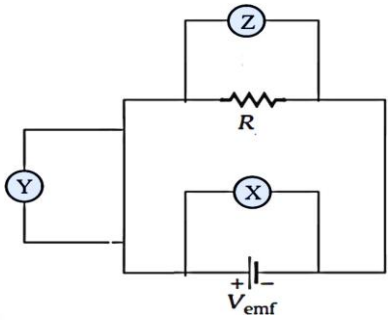
12. *Which of the following circuits will function properly?*



ⓐ ⓑ ⓒ ⓓ

Ammeters and Voltmeters in circuits

13. *Three voltmeters are shown in the figure. Which one will measure zero?*



ⓐ X ⓑ Y ⓒ Z ⓓ X&Y

RC Circuits

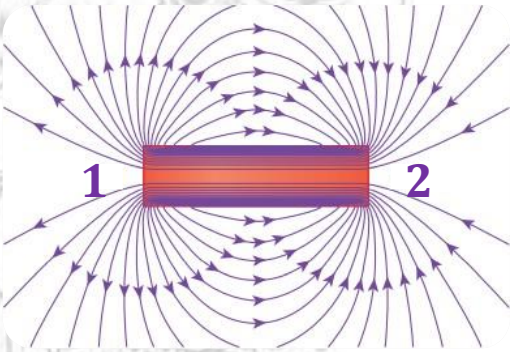
14. *An RC circuit has a time constant of* 0.10 *s and a* 1000 Ω *resistor. What is the capacitance of the capacitor in this circuit?*

ⓐ $1.0 \times 10^{-4} F$ ⓑ $1.0 \times 10^{3} F$ ⓒ $6.0 \times 10^{-4} F$ ⓓ $1.0 \times 10^{-1} F$

Magnetic Field Lines of a Permanent Magnet :

15. *Which of the following is correct when determining the north pole and south pole for the magnet and a compass?*

	Magnet	Compass
ⓐ	1 *is north*	1 *is north*
ⓑ	2*is south*	1 *is north*
ⓒ	2 *is north*	1 *is south*
ⓓ	2 *is south*	1 *is south*

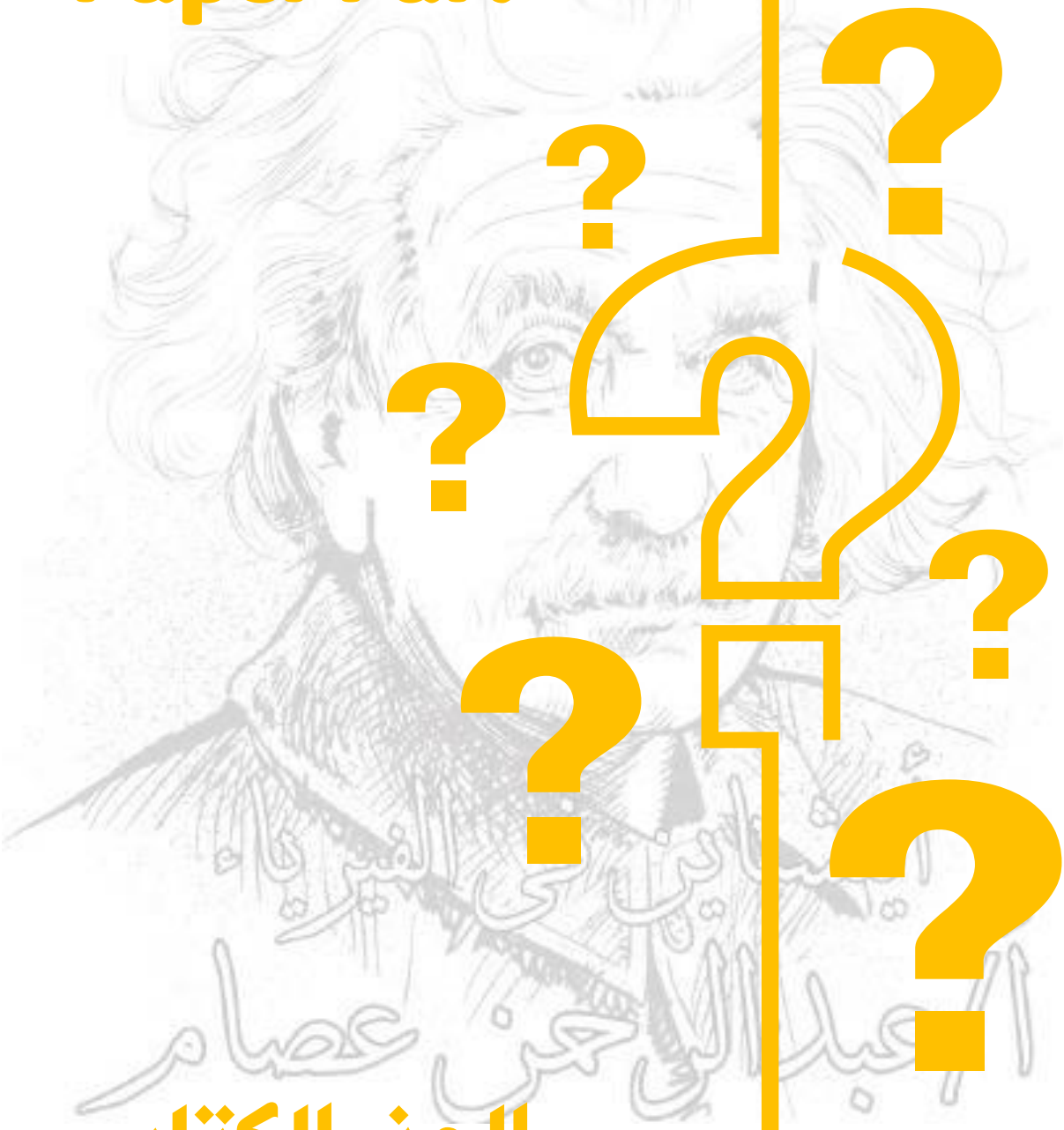


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PART _2

Paper Part



الجزء الكتابي

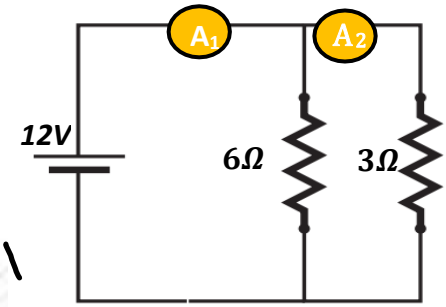
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1. *According to the circuit bellow:*

A. *Find reading the ammeter A1.*

B. *Find reading the ammeter A2.*



$R_{eq} = \left(\frac{1}{R_1} + \frac{1}{R_2}\right)^{-1} = \left(\frac{1}{6} + \frac{1}{3}\right)^{-1} = 2\,\Omega$

$I_1 = \frac{\Delta V}{R_{eq}} = \frac{12}{2} = 6A$

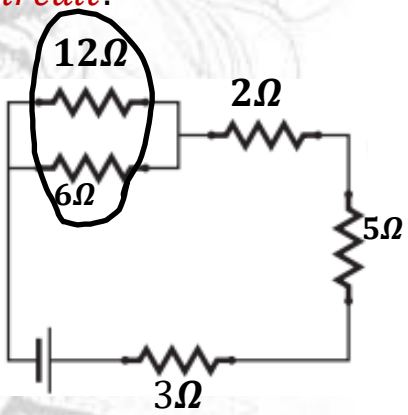
$I_2 = \frac{\Delta V}{R_2} = \frac{12}{3} = 4A$

2. *The figure represents a circuit.*

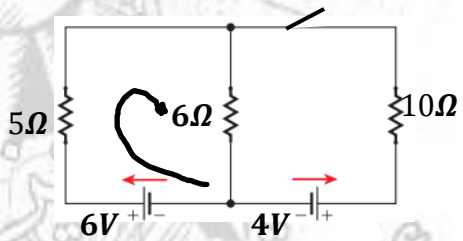
Calculate the equivalent resistance in the circuit.

$R_p = \left(\frac{1}{12} + \frac{1}{6}\right)^{-1} = 4\,\Omega$

$R_{eq} = 4 + 2 + 5 + 3 = 14$



3. *In the figure below*



A. What is the current in (R = 10Ω)?

$I = Zero$

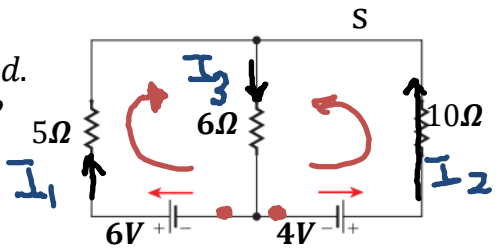
B. *What is the current in (R = 6Ω)?*

$+6 - 5I - 6I = zero$ solve for x

$\therefore I = \frac{6}{11} = 0,54A$

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4. *In the figure below after the switch S is closed.*
What is the current in $(R = 10\ \Omega)$ *and* $(R = 6\ \Omega)$?



$I_1 + I_2 - I_3 = 0$

$+6 - 5I_1 - 6I_3 = 0 \Rightarrow -5I_1 + 0I_2 - 6I_3 = -6$

$+4 - 10I_2 - 6I_3 = 0 \Rightarrow 0I_1 - 10I_2 - 6I_3 = 0$

$I_1 = 0.51A \quad I_2 = 0.057A \quad I_3 = 0.57A$

5. *By analyzing the units:*
What does the tesla unit equal to in terms of newtons, amperes, and meters?

$F = qBV \Rightarrow B = \frac{F}{qV} = \frac{N}{C \times m/s} = \frac{N \cdot s}{C \cdot m} = \frac{N}{A \cdot m}$

6. *As shown in the figure, an electron moving at a velocity of* $(v = 720\ m/s)$ *, enters a uniform magnetic field of* $(B = 2.4 \times 10^{-10}\ T)$
Calculate the acceleration of the electron.
(Ignore the effect of earth gravitation)



$F = qVB$

$a = \frac{f}{m} = \frac{1.6 \times 10^{-19} \times 720 \times 2.4 \times 10^{-10}}{9.1 \times 10^{-31}} = 30.39 \times 10^{3}\ m/s^2$

مع اطيب التمنيات بالنجاح

استاذ عبدالرحمن عصام