Physics Final Exam

End Of Term 2 Grade 12 Advanced

Chapter 5: Current and Resistance
Chapter 6: Direct Current Circuits
Chapter 7: Magnetism



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Q.1: Resistivity of a wire

A cylindrical aluminum wire is (32 m) long and has a resistance of (0.20 Ω). If the resistivity of aluminum is (2.82×10^{-8} Ω.m). What is the radius of the wire?

(Hint: Area of the circle is equal to πr^2)

a) 1.198×10^{-3} m

b) 1.436×10^{-6} m

c) 1.436×10^{-3} m

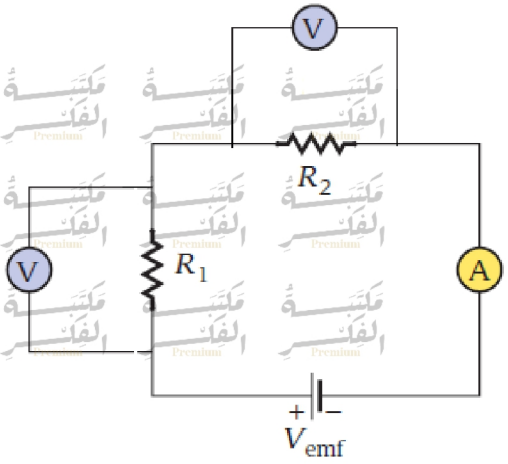
d) 4.512×10^{-6} m

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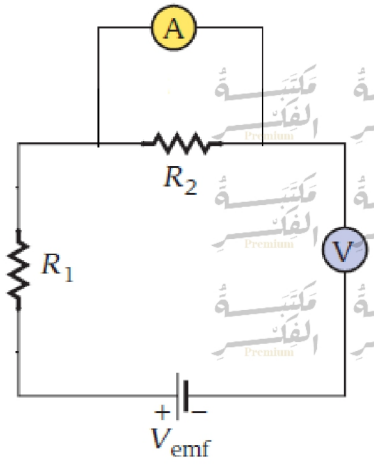
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Q.2: Ammeters and Voltmeters in circuits

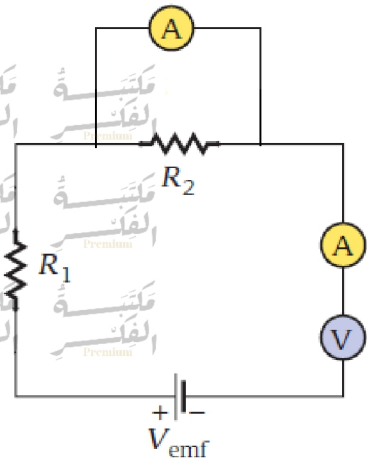
Which of the following circuits will function properly?



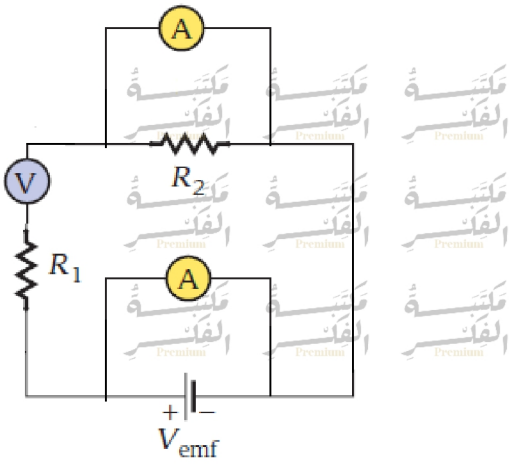
a)



b)



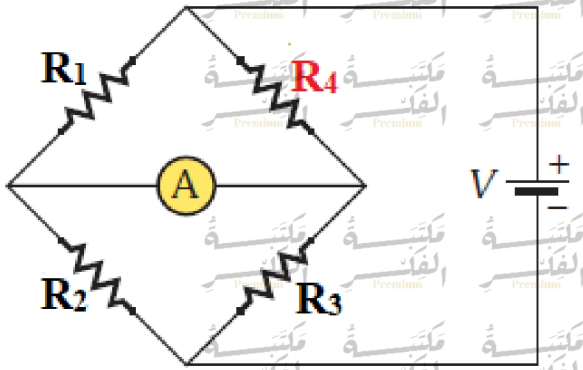
c)



d)

Q.3: Resistors in Wheatstone Bridge

According to the figure, if the reading of the sensitive ammeter (A) is zero, ($R_1 = 6\ \Omega$), ($R_2 = 4\ \Omega$) and ($R_3 = 8\ \Omega$), what is the magnitude of R_4?



a) 12 Ω

b) 4 Ω

c) 18 Ω

d) 6 Ω

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Q.4: Change in current in Multiloop Circuit

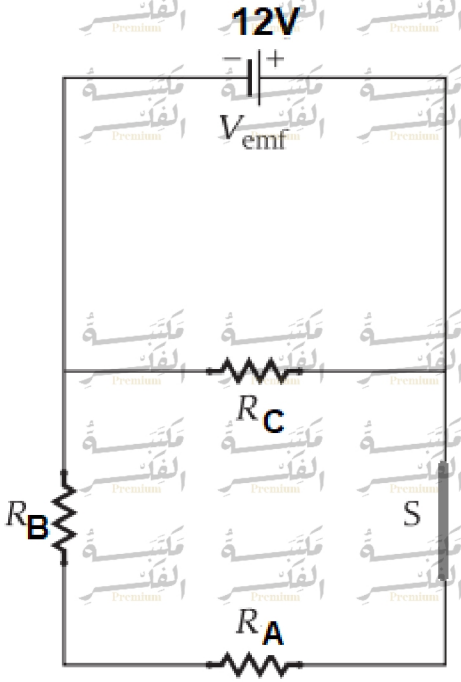
The figure shows three identical resistors connected in a circuit. The switch S is initially closed. If Saif opened the switch, what happens to the current flowing in Rc?

a) Stays the same

b) Increases

c) Decreases

d) Becomes zero



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Q.5: Equivalent resistance of resistors in parallel

Three identical resistors connected together in parallel. If the equivalent of the three resistors is (6.0 Ω). What is the resistance of any resistor of them?

a) 6.0Ω

b) 2.0Ω

c) 18.0Ω

d) 27.0Ω

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Q.6: Resistors in series and the current

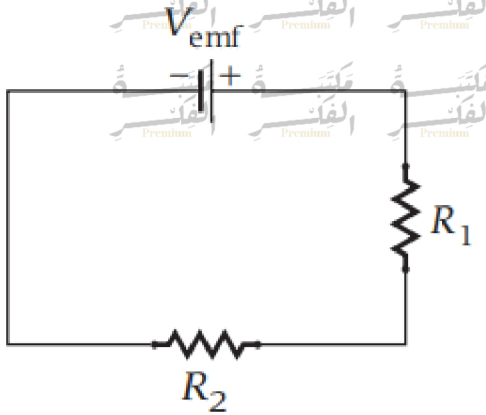
According to the figure, when a third resistor is added in series to the two resistors connected in series. What happens to the the electric current passing through the circuit?

a) Decrease

b) Increase

c) Stays the same

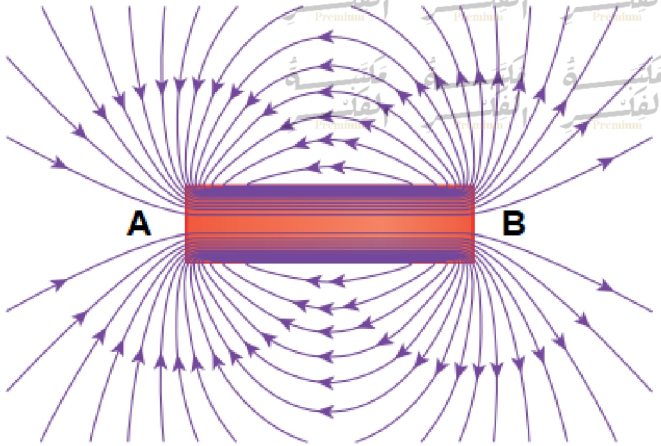
d) Becomes infinity



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Q.7: Magnetic fields line of a permanent magnet

The figure shows the magnetic field lines of a permanent magnet. Which of the following is correct when determining the north pole and south pole of the magnet?



a) B is the north pole

b) A is the north pole

c) B is the south pole

d) There isn't enough data to determine the poles

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Q.8: Magnetic Force direction on charged particle

According to the figure, in what direction the proton (p) will be deflected as it enters the constant magnetic field (B)?



a) Toward y positive

b) Toward y negative

c) Into the page

d) Out of the page

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Q.9: Ohm’s Law

Which of the following is equal to the unit of siemens (S)?

a) 1 S = 1 A / 1 V

b) 1 S = 1 V / 1 A

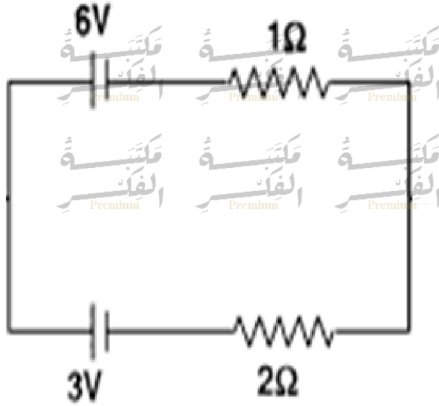
c) 1 S = 1 V^2 / 1 A

d) 1 S = 1 A^2 / 1 V

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Q.10: Current in Single-Loop Circuits

What is the current flowing through the loop shown in the figure?



a) 1A Clockwise

b) 2A Clockwise

c) 1A Counterclockwise

d) 2A Counterclockwise

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Q.11: sign convention for potential changes in analyzing loops

When analyzing loops in electric circuits, which of the following assumptions 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	$+V_{emv}$
V_{emv}	Opposite to emf	$-V_{emv}$

Element	Direction of Analysis	Potential Change
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V_{emv}	Opposite to emf	$+V_{emv}$

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Q.12: Electric Current and charge

If the equation between charge and time is ($q = 5t^2 + 3t$). What is the correct expression of the current (i)?

a) $i = 10t + 3$

b) $i = 5t^2 + 3t$

c) $i = 5t^3/3 + 3t^2/2$

d) $i = 10t + 3t$

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Q.13: Milliampere-hour and the charge

A rechargeable battery is rated at (3.0 mAh). What is the total charge in Coulombs unit (C) of the battery can deliver when fully charged?

a) 10.8 C

b) 3.6 C

c) 3.0 C

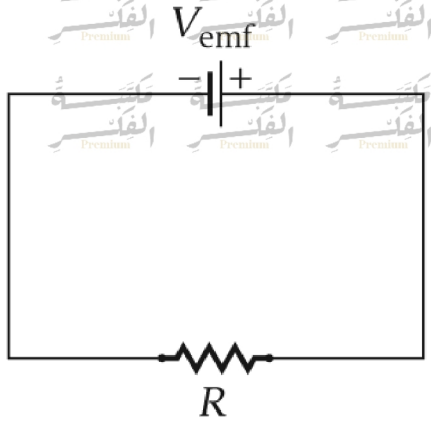
d) 1.6 C

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Q.14: Electromotive Force, Resistance and Current

For the electric circuit shown in the figure: if the battery's electromotive force is (12 V), the resistance is (R = 2.4 Ω), what is the electric current flowing through the circuit?



a) 5.0 A

b) 28.8 A

c) 2.0 A

d) 0.2 A

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Q.15: Torque on a Current-Carrying Loop

A coil (X) consists of (400) loop and a coil (Y) consists of (900) loop, If the torque on each loop of the coil (X) is equal to the torque on each loop of the coil (Y). What is the ratio of the torques?

a) 2/3

b) 9/4

c) 4/9

d) 3/2

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Q.16: Units of Magnetic Field Strength

Which of the following is equal to the unit of the magnetic field strength Tesla (T)?

a) $N \cdot s/ C \cdot m$

b) $N \cdot m/ C \cdot s$

c) $N \cdot A/ m$

d) $N \cdot m/ A$

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Q.17: Motion of Charged Particles in a Magnetic Field

In the equation ($B = mv/|q|x$), what does (x) represent?

a) The radius

b) The diameter

c) The acceleration

d) The angle

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Q.18: Biot-Savart Law and μo

What is the constant (μ_o) called?

a) The magnetic permeability of free space

b) The magnetic conductivity of free space

c) The magnetic resistivity of free space

d) The magnetic relativity of free space

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Q.19: Current Density

Which of the following is not true for current density (j) and current (i)?

a) $j = i/A$

b) $i = \int j \cdot dA$

c) Unit of current density equal to Ampere per Meter square

d) Unit of current density equal to Ampere per Meter

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Q.20: Energy and Power in Electric Circuits

An electrical device with a power of (968 W) is connected to a source of electromotive force (V_{emf} = 220V). What is the resistance of this device?

a) 50 Ω

b) 0.23 Ω

c) 4.4 Ω

d) 2.0 Ω

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Q.21: RC Circuits and τ (the time constant)

An RC circuit consisting of a (12.0V) battery. The charge on the capacitor as a function of time is given by:

$$q(t) = 6.0 \times 10^{-4}(1 - e^{t/0.1})$$

What is the capacitance of the capacitor in this circuit?

a) 5.0×10^{-5} F

b) 7.2×10^{-5} F

c) 6.0×10^{-4} F

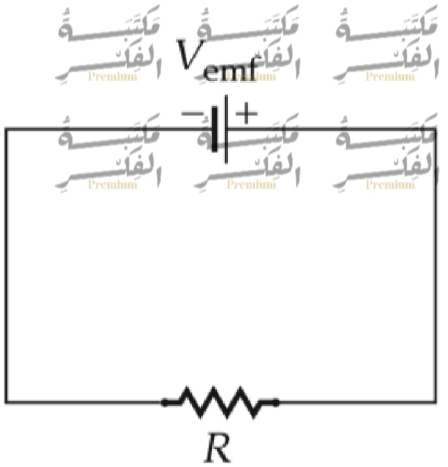
d) 6.0×10^{-5} F

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Q.22: Electromotive force and current

For the circuit shown in the figure, if another resistor with equal resistance was connected with *R* in parallel, what happens to the magnitude of the current flowing through the battery?



a) Becomes twice

b) Becomes half

c) Stays the same

d) Becomes four times

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Q.23: Magnetic force on moving charged particle

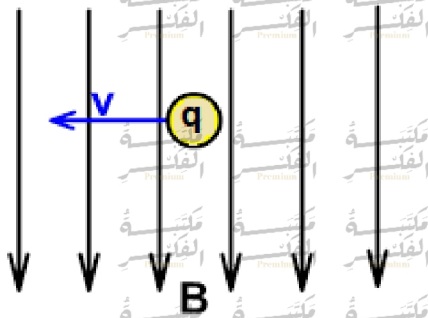
A particle with charge ($q = +3.2$ μC) and speed ($v = 520\ m/s$), enters a uniform magnetic field of ($B = 0.2$ T) as seen in the figure. What is the magnitude of the magnetic force on the particle?

a) 332.8 μN

b) 166.4 μN

c) 3.2 μN

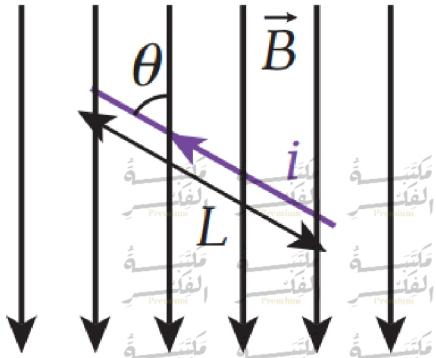
d) 520 μN



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Q.24: Magnetic force on the wire

According to the figure, an isolated segment of wire of length ($L = 8.3$ m) carries a current of magnitude ($i = 1.5$ A) at an angle ($\theta = 60.0°$) with respect to a constant magnetic field of magnitude ($B = 5.4 \times 10^{-2}$ T). What is the magnitude of the magnetic force on the wire?



a) 0.58N

b) 0.29N

c) 2.16N

d) 0.33N

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Q.25: Kirchhoff's Junction Rule

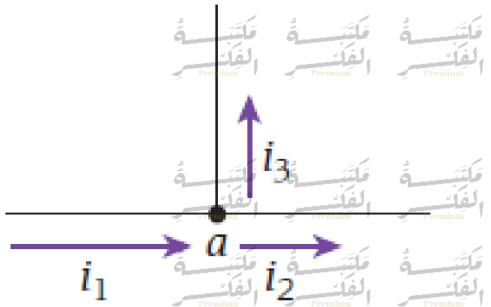
According to the figure if ($i_1 = 0.5$ A) and ($i_2 = 0.2$ A), what is the magnitude of (i_3)?

a) 0.3 A

b) 0.2 A

c) 0.5 A

d) 0.7 A



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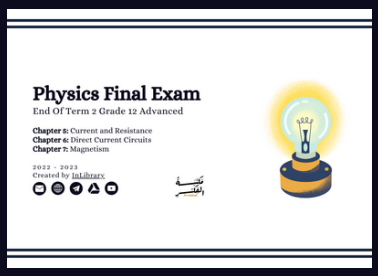
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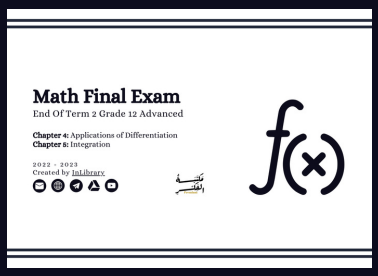
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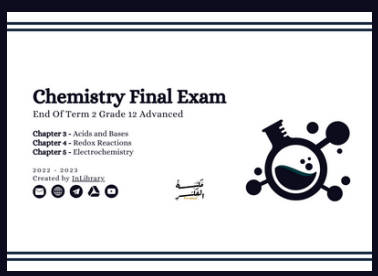
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فقط 59.9 درهم

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- التربية الإسلامية -
- مراجعة نهاية الفصل (216 سؤال)
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