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IGCSE PHYSICS 0625 · TOPICAL PAST PAPERS

Electric Current

Paper 1 — Multiple-Choice Questions (topical compilation)

Fahad H. Ahmad

Contact: **+92 323 509 4443**

M.Eng NUS Singapore · B.Eng NUST · 15+ years of teaching experience in Singapore, UAE & Pakistan · 60,000+ subscribers and 20 million+ video lecture views.

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CURRENT ELECTRICITY

PAPER 1 QUESTIONS

Electrical quantities (charge, current, voltage, resistance, power, energy)

QUESTION # 1: M/J 16 P11

29 The current in a car headlamp is 2.0 A. The headlamp is switched on for 4.0 minutes.

How much charge passes through the headlamp?

- A 8.0 C B 30 C C 120 C D 480 C

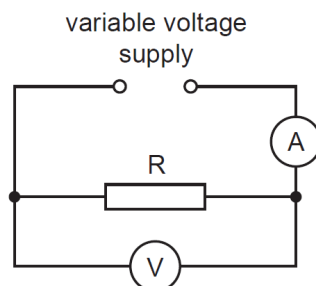
QUESTION # 2: M/J 16 P11

30 How can *one volt* also be expressed?

- A one coulomb per ampere
B one coulomb per joule
C one joule per ampere
D one joule per coulomb

QUESTION # 3: M/J 16 P11

34 A student is investigating resistance using the circuit shown.



The resistance of R is approximately 5Ω .

What are the most suitable ranges for the voltmeter and for the ammeter?

	voltmeter range	ammeter range
A	0–2 V	0–0.5 A
B	0–2 V	0–2 A
C	0–5 V	0–5 A
D	0–10 V	0–5 A

QUESTION # 4: M/J 16 P12

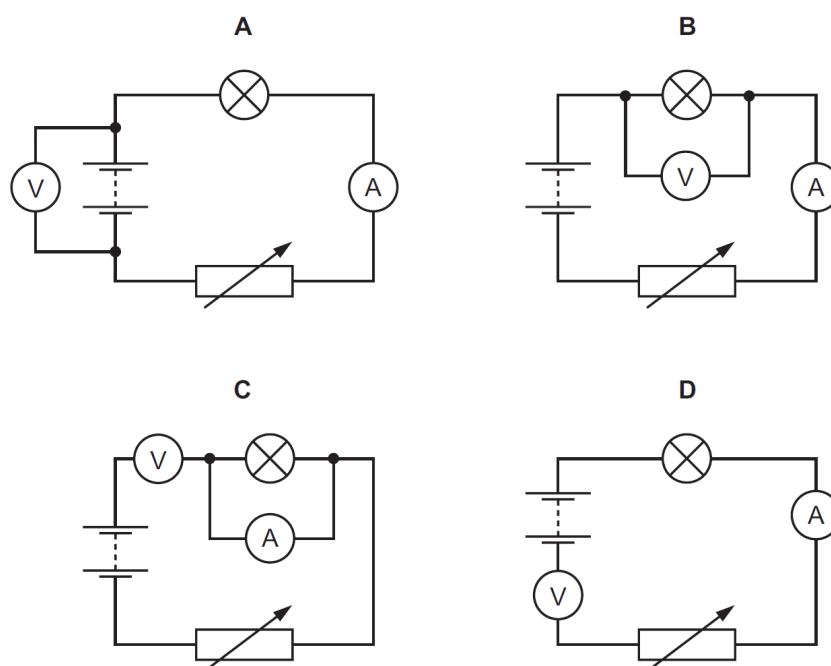
25 A charge of 45 C flows through an electric appliance in 3.0 minutes.

What is the average current in the appliance?

- A** 0.25 A **B** 4.0 A **C** 15 A **D** 135 A

QUESTION # 5: M/J 16 P12

28 Which diagram shows the arrangement of the ammeter and voltmeter to obtain readings to find the power of a lamp?

**QUESTION # 6: M/J 17 P11**

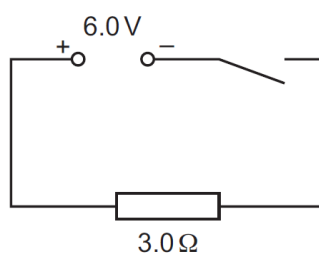
36 During a thunderstorm, a lightning flash occurs when charge flows between a cloud and the Earth. On average, 20 C of charge flows during each flash and there are three flashes every minute.

What is the average current between the cloud and the Earth during the thunderstorm?

- A** 1.0 A **B** 36 A **C** 60 A **D** 1800 A

QUESTION # 7: M/J 17 P12

33 The circuit shown is switched on for 1.0 minute.



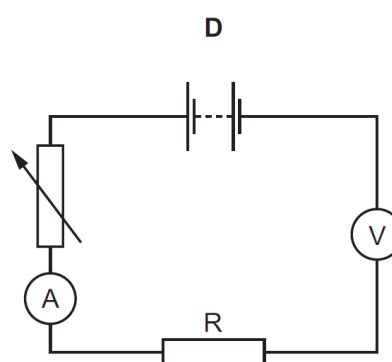
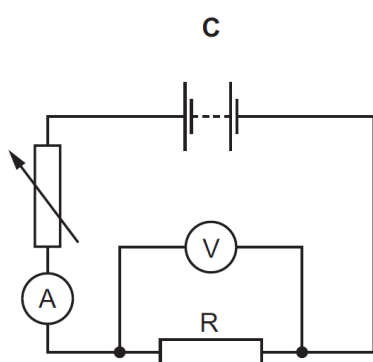
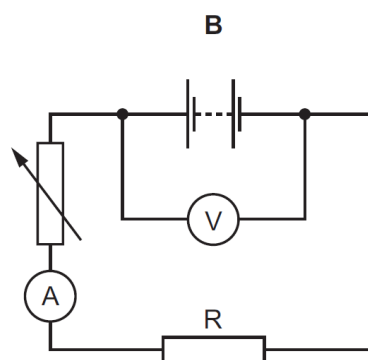
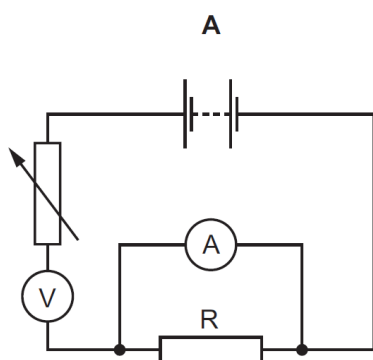
How much charge passes through the 3.0Ω resistor?

- A** 2.0C **B** 12C **C** 120C **D** 720C

QUESTION # 8: M/J 17 P12

34 The readings of an ammeter and a voltmeter are used to calculate the resistance of resistor R.

Which circuit shows the ammeter and voltmeter in the correct positions?



QUESTION # 9: M/J 18 P12

35 V is a potential difference, I is a current, R is a resistance, and t is a time.

Which expression has units of energy?

- A It B I^2R C VIt D $\frac{V^2}{R}$

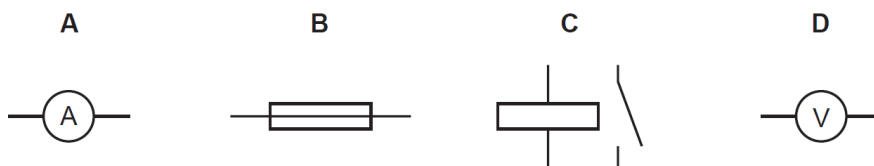
QUESTION # 10: M/J 19 P11

32 Which unit is the same as a volt?

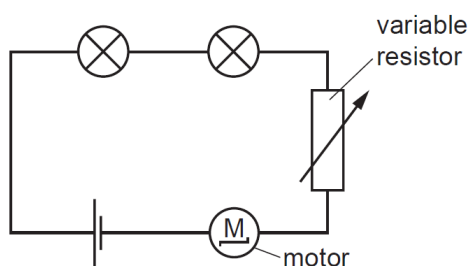
- A ampere / ohm
B ampere / watt
C ohm / ampere
D watt / ampere

QUESTION # 11: M/J 19 P11

34 What is the symbol for a device that measures current?

**QUESTION # 12: M/J 19 P12**

33 The diagram shows a simple circuit.

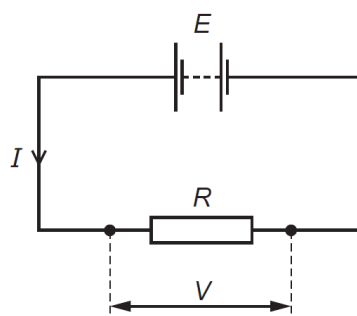


What happens when the resistance of the variable resistor is increased?

- A The lamps are dimmer and the motor rotates more quickly.
B The lamps are dimmer and the motor rotates more slowly.
C The lamps have the same brightness and the motor rotates more quickly.
D The lamps have the same brightness and the motor rotates more slowly.

QUESTION # 13: M/J 19 P12

34 The diagram shows a simple electrical circuit.



Which statement **cannot** be correct?

- A The current I is 2 A.
- B The e.m.f. E is 12 J.
- C The p.d. V (across the resistor) is 10 V.
- D The resistance R is 5Ω .

QUESTION # 14: M/J 20 P11

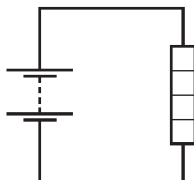
36 A battery consists of three identical cells in parallel.

What is the unit of electromotive force (e.m.f.) and to what is the e.m.f. of the battery equal?

	unit	e.m.f. of the battery is equal to
A	J/C	the sum of the e.m.f.s of the three cells
B	J/C	the e.m.f. of one of the cells
C	N/V	the sum of the e.m.f.s of the three cells
D	N/V	the e.m.f. of one of the cells

QUESTION # 15: O/N 16 P12

- 33 An ammeter and a voltmeter are connected into the circuit shown when determining the power produced by a heater.



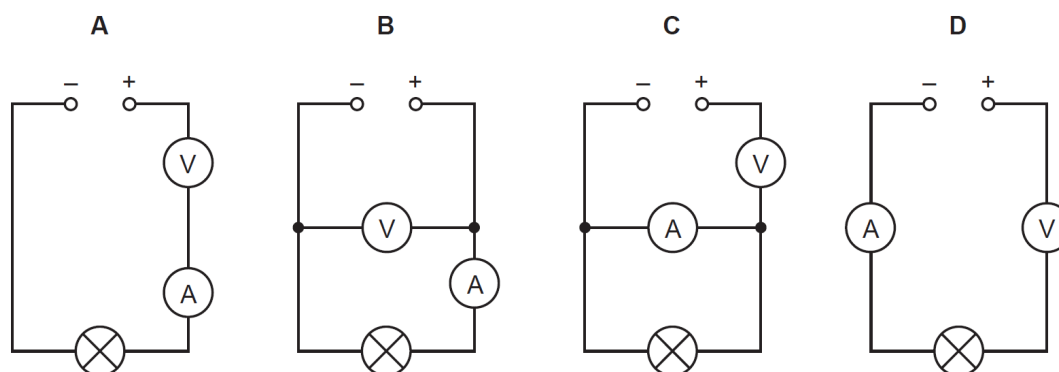
How are these meters connected, in relation to the heater?

	ammeter	voltmeter
A	in parallel	in parallel
B	in parallel	in series
C	in series	in parallel
D	in series	in series

QUESTION # 16: O/N 17 P11

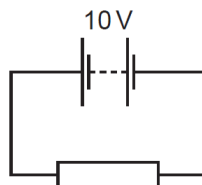
- 30 In a circuit, a voltmeter is used to measure the potential difference across a lamp. An ammeter is used to measure the current in the lamp.

Which diagram shows the circuit?



QUESTION # 17: O/N 18 P11

29 A battery of electromotive force (e.m.f.) 10 V is connected to a resistor.



A charge of 2.0 coulombs passes through the resistor.

How much work is done as the charge passes through the resistor?

- A 0.20 J B 2.0 J C 5.0 J D 20 J

QUESTION # 18: O/N 18 P12

29 Students are asked to describe an experiment to measure the resistance of a metallic conductor.

Which description is correct?

- A Connect an ammeter in parallel and a voltmeter in series with the conductor then use $R = \frac{I}{V}$.
 B Connect an ammeter in parallel and a voltmeter in series with the conductor then use $R = \frac{V}{I}$.
 C Connect a voltmeter in parallel and an ammeter in series with the conductor then use $R = \frac{I}{V}$.
 D Connect a voltmeter in parallel and an ammeter in series with the conductor then use $R = \frac{V}{I}$.

QUESTION # 19: O/N 18 P12

32 A defibrillator is a device that is used to give an electric shock to a patient's heart.

It supplies an electric shock with energy 240 J at an average voltage of 2000 V for 10 ms.

What is the average current it supplies?

- A 0.012 A B 1.2 A C 12 A D 120 A

QUESTION # 20: O/N 19 P12

32 Which symbol does **not** represent a power source?



QUESTION # 21: O/N 20 P12

29 What is stored in a battery and what is its unit?

	quantity	unit
A	current	A
B	current	As
C	energy	J
D	energy	J/s

QUESTION # 22: O/N 20 P12

30 A car battery delivers 150 kC to a circuit before it needs recharging.

Two headlamps connected in parallel to the battery are switched on. There is a current of 4.0 A in each lamp.

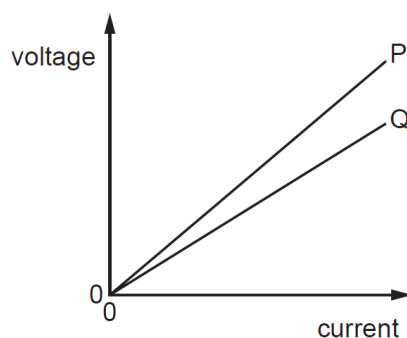
How much time passes before the battery needs recharging?

- A** 2.6 hours **B** 5.2 hours **C** 7.8 hours **D** 10.4 hours

Resistance and resistivity

QUESTION # 1: M/J 16 P11

32 The graph is the voltage-current graph for two resistance wires P and Q.



The wires are made from the same material and have equal lengths.

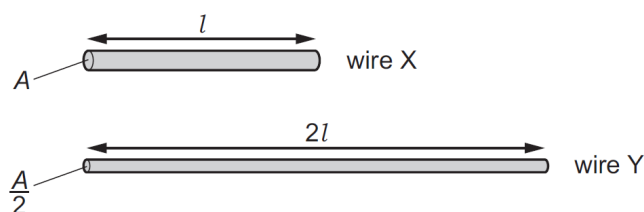
The resistances of the wires and their cross-sectional areas are different.

Which wire has the greater resistance and which wire has the larger cross-sectional area?

	greater resistance	larger cross-sectional area
A	P	P
B	P	Q
C	Q	P
D	Q	Q

QUESTION # 2: M/J 18 P11

29 A copper wire X has resistance R . Another copper wire Y has twice the length and half the cross-sectional area of X.

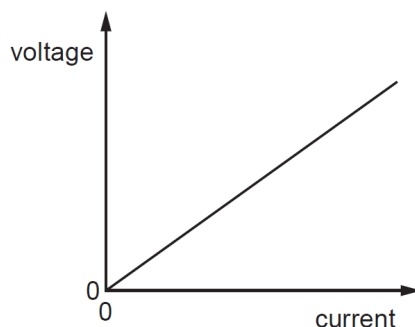


What is the resistance of Y?

- A** $\frac{R}{2}$ **B** R **C** $2R$ **D** $4R$

QUESTION # 3: M/J 19 P11

33 The voltage / current graph for a metal wire is shown.



What does the gradient of this graph represent?

- A the charge passing through the wire
- B the e.m.f. of the battery connected to the wire
- C the energy produced in the wire
- D the resistance of the wire

QUESTION # 4: M/J 20 P12

37 A metal wire of length l and cross-sectional area A has resistance R .

A second wire is made from the same metal. It has a length $2l$ and a cross-sectional area $4A$.

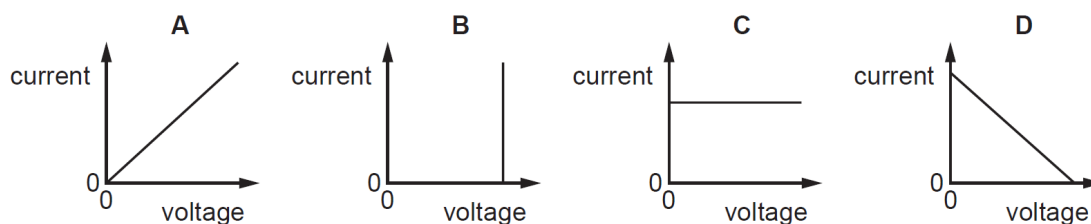
What is the resistance of the second wire?

- A $8R$ B $2R$ C $\frac{R}{2}$ D $\frac{R}{8}$

QUESTION # 5: O/N 18 P11

27 The voltage across a resistor of fixed resistance changes.

Which graph shows how the current in the resistor changes with the voltage?



QUESTION # 6: O/N 18 P11

28 A wire of length 0.50 m and cross-sectional area $1.0 \times 10^{-6} \text{ m}^2$ has a resistance of 0.75Ω .

Another wire of the same material has a length of 2.0 m and a cross-sectional area of $0.50 \times 10^{-6} \text{ m}^2$.

What is the resistance of the longer wire?

- A** 0.094Ω **B** 0.38Ω **C** 1.5Ω **D** 6.0Ω

QUESTION # 7: O/N 19 P12

38 A thermistor warms up as the current in it increases.

Which graph shows how the voltage V across the thermistor changes as the current I through it is increased?

