Practice Question Set For A-Level
Subject : Physics
Paper-1 Topic : 3_ElectricCircuits

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Name of the Student:_____
Max. Marks : 15 Marks **Time : 15 Minutes**

Q1.

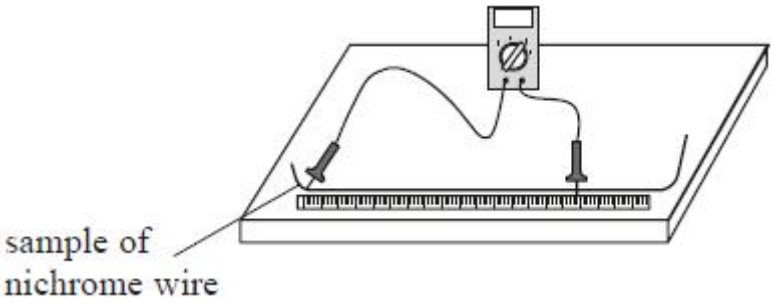
A copper wire of length 2.5 m and cross-sectional area 2.4×10^{-7} m^2 has a resistivity of 1.7×10^{-8} Ω m
What is the resistance of the wire?

- ☒ **A** 1.6×10^{-15} Ω
- ☒ **B** 1.0×10^{-14} Ω
- ☒ **C** 0.18 Ω
- ☒ **D** 5.6 Ω

(Total for question = 1 mark)

Q2.

An ohmmeter was used to measure the resistance *R* of a length *l* of nichrome wire as shown.
This was then repeated for different values of *l*.



The diameter of the wire was measured and the cross-sectional area *A* of the wire calculated.
A graph was plotted. The gradient of the graph was equal to the resistivity of nichrome.
Which row of the table shows the quantities which were plotted on the *y*-axis and the *x*-axis?

	y-axis	*x*-axis
☐ **A**	l	RA
☐ **B**	lA	R
☐ **C**	R	Al
☐ **D**	RA	l

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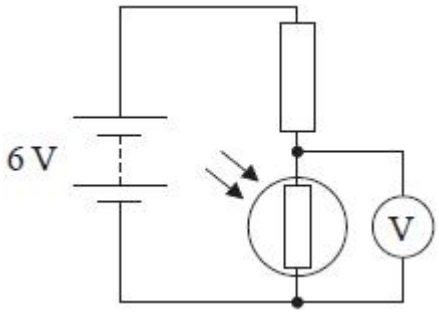
(Total for question = 1 mark)

Q3.

A light-dependent resistor (LDR) and resistor are connected in series with a 6V battery as shown.
A voltmeter measures the potential difference across the LDR.



In daylight the voltmeter reads 3.0V.

Which reading is most likely if the circuit is now in total darkness?

(1)

☒ **A** a little above 0 V

☒ **B** a little below 3 V

☒ **C** a little above 3 V

☒ **D** a little below 6 V

(Total for question = 1 mark)

Q4.

Answer the question with a cross in the box you think is correct ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

Which of the following is the SI base unit for resistance?

☒ **A** Ω

☒ **B** $V\ A^{-1}$

☒ **C** $kg\ m^2\ s^{-3}\ A^{-2}$

☒ **D** $kg\ m^2\ s^{-1}\ C^{-2}$

(Total for question = 1 mark)

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Q5.

Answer the question with a cross in the box you think is correct ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

Which of the following gives the S.I. base units equivalent to the volt?

- ☐ **A** $J\,C^{-1}$
- ☐ **B** $J\,A^{-1}\,s^{-1}$
- ☐ **C** $kg\,m^{2}\,s^{-2}\,C^{-1}$
- ☐ **D** $kg\,m^{2}\,s^{-3}\,A^{-1}$

(Total for question = 1 mark)

Q6.

Answer the question with a cross in the box you think is correct ☒ . If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒ .

A copper wire has a cross-sectional area *A* and length *l*. There is a potential difference *V* across the wire. The resistance of the wire is *R*.

Copper has *n* conduction electrons per unit volume.

Which of the following expressions gives the drift velocity of the electrons along the wire?

- ☐ **A** $\frac{RnAe}{V}$
- ☐ **B** $\frac{R}{VnAe}$
- ☐ **C** $\frac{V}{RnAe}$
- ☐ **D** $\frac{VnAe}{R}$

(Total for question = 1 mark)

Q7.

Answer the question with a cross in the box you think is correct ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

The diagram shows an electric motor pulling a truck of mass *m* along a slope. The truck moves through a vertical

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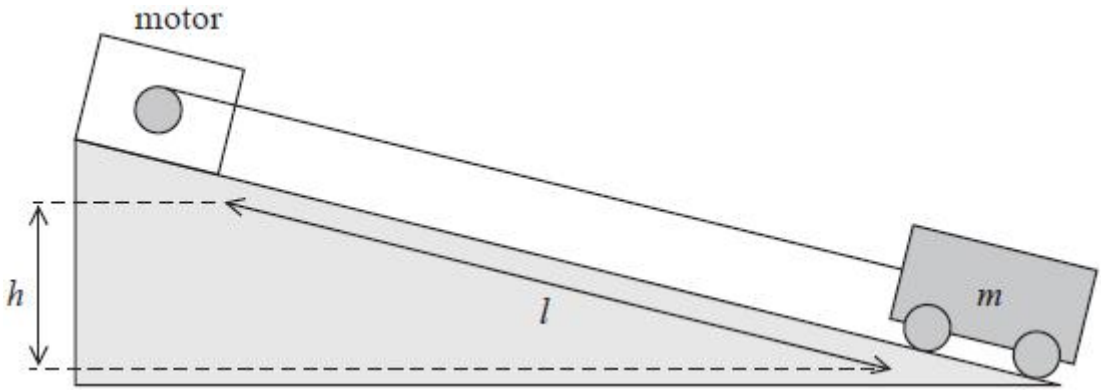
height *h* and a distance *l* along the slope, during a time *t*.

There is a potential difference *V* across the motor and a current *I* in the motor.



Which of the following expressions gives the efficiency of the motor?

☒ **A** $\frac{VIt}{mgl}$

☒ **B** $\frac{VIt}{mgh}$

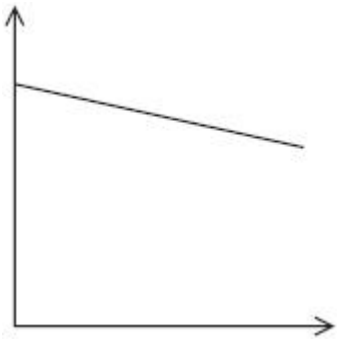
☒ **C** $\frac{mgl}{VIt}$

☒ **D** $\frac{mgh}{VIt}$

(Total for question = 1 mark)

Q8.

A student investigated the e.m.f. and internal resistance of a battery. The student produced the following sketch graph.



Which row of the table gives the quantities plotted?

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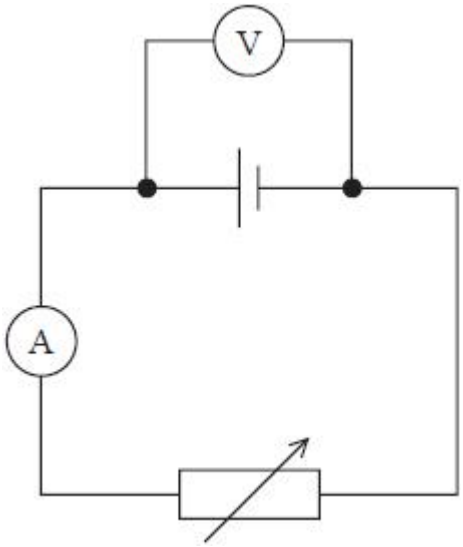
		y-axis	*x*-axis
☒	**A**	e.m.f.	circuit resistance
☒	**B**	e.m.f.	current
☒	**C**	terminal potential difference	circuit resistance
☒	**D**	terminal potential difference	current

(Total for question = 1 mark)

Q9.

Answer the question with a cross in the box you think is correct ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

A variable resistor is connected in a circuit as shown. The cell has internal resistance.



The resistance of the variable resistor is increased.

Which row of the table is correct?

		Ammeter reading	Voltmeter reading
☒	**A**	increases	increases
☒	**B**	increases	decreases
☒	**C**	decreases	increases
☒	**D**	decreases	decreases

(Total for question = 1 mark)

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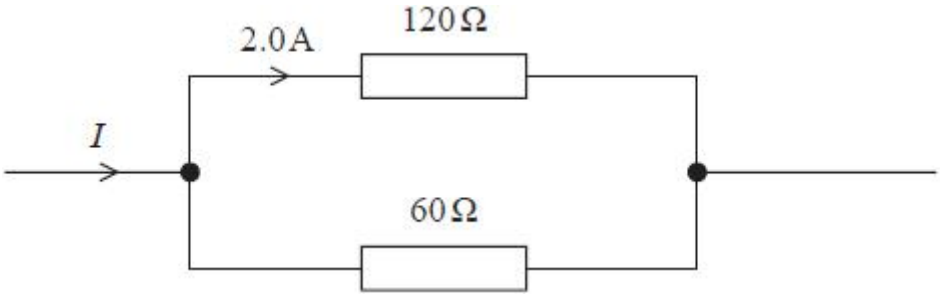
Q10.

Two resistors are connected in parallel and the current in one of them is 2.0 A, as shown.



Which of the following is the total resistance of the resistors in parallel?

- **A** 20 Ω
- **B** 40 Ω
- **C** 90 Ω
- **D** 180 Ω

(Total for question = 1 mark)

Q11.

An ampere can be expressed as

- **A** $C\ s^{-1}$
- **B** $J\ C^{-1}$
- **C** $V\ W^{-1}$
- **D** $V\ \Omega$

(Total for question = 1 marks)

Q12.

Which of the following is a correct unit for resistance?

- **A** $J\ C^{-1}$
- **B** $V\ C^{-1}\ s^{-1}$
- **C** $J\ C^{-2}\ s$
- **D** $J\ C^{-2}\ s^{-1}$

(Total for question = 1 mark)

Q13.

A student carried out an experiment to investigate the current-potential difference characteristics of a diode

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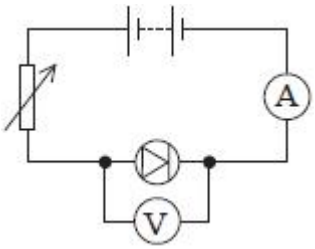
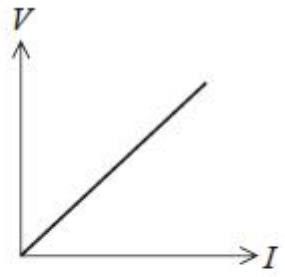
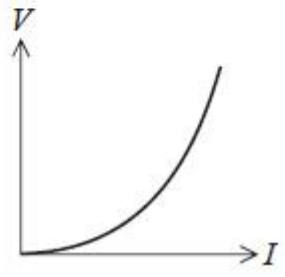
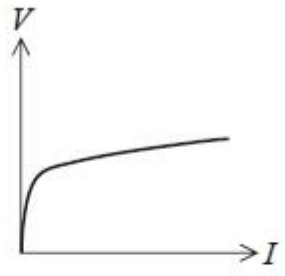
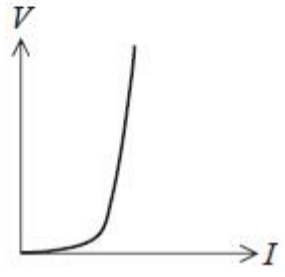
using the circuit below.



He plotted the graph of potential difference *V* on the *y*-axis against the corresponding current *I* on the *x*-axis.

Which graph would be obtained by the student?

(1)

☒ **A**	
☒ **B**	
☒ **C**	
☒ **D**	

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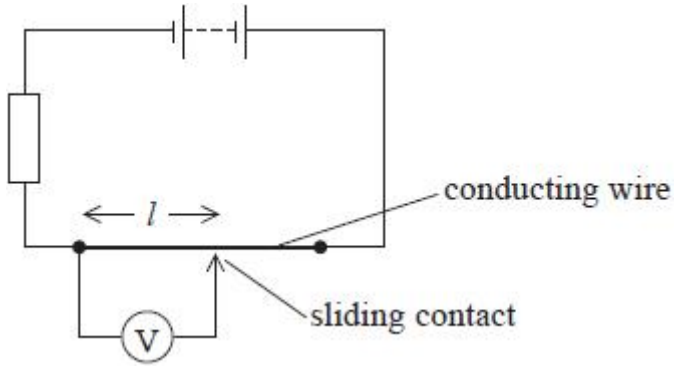
Q14.

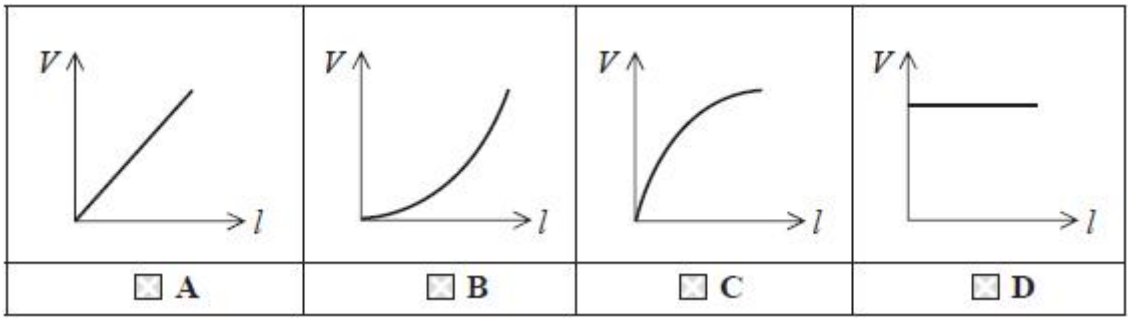
A student set up the circuit below and moved a sliding contact along a uniform conducting wire.

The student recorded the potential difference *V* across each length of wire *l* under test.



Which graph correctly shows how *V* varies with *l*?

(1)



(Total for question = 1 mark)

Q15.

Answer the question with a cross in the box you think is correct ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

The graph shows the variation of current *I* with potential difference *V* for a diode.

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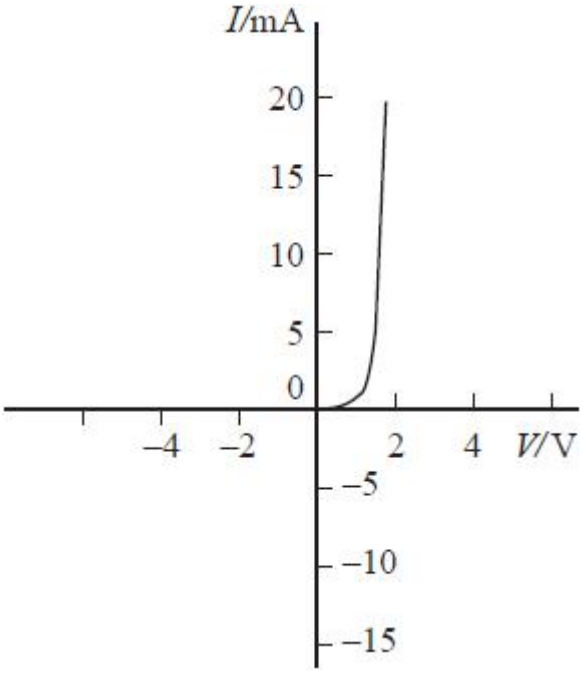

Which of the following statements is correct?

- ☒ **A** The diode has zero resistance when connected in the forward direction.
- ☒ **B** The diode has zero resistance when connected in the reverse direction.
- ☒ **C** The diode starts to conduct when the potential difference is about 0.7 V.
- ☒ **D** The diode stops conducting when the potential difference is about −0.7 V.

(Total for question = 1 mark)

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