

Q1.

Question number	Answer	Mark
	C ammeter in series with component, voltmeter in parallel Only option C is correct for both the ammeter and the voltmeter	(1) AO1

Q2.

Question Number	Answer	Acceptable answers	Mark
(a)(i)	B		(1)

Q3.

Question number	Answer	Additional guidance	Mark
(a)	<ul style="list-style-type: none">connect ammeter in series (with thermistor) (1)connect voltmeter in parallel (with thermistor) (1)reverse (connections for) one of the cells (1)	allow idea that meters should be swapped for two marks (equivalent to first two points)	(3)

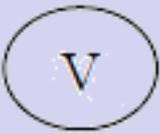
Q4.

	Answer	Acceptable answers	Mark
(a)(i)	D variable resistor		(1)
(a)(ii)	B in parallel with the lamp		(1)

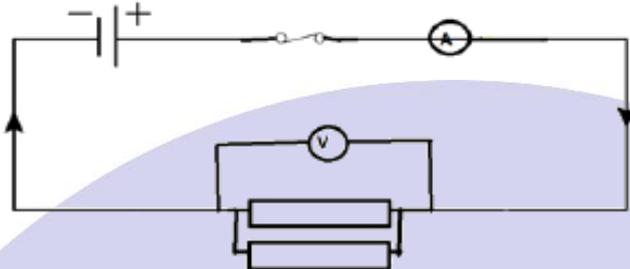
Q5.

Question number	Answer	Additional guidance	Mark
	voltmeter should be moved (1) (to be) in parallel with the resistor X (1)	voltmeter is in wrong place / (re)connect the voltmeter allow 'voltage' for 'voltmeter' in this context allow across X or equivalent statement answers may be seen on the diagram	(2)

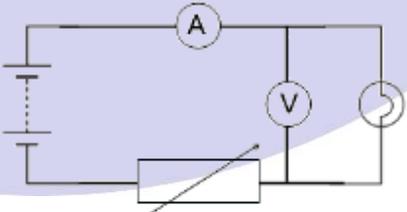
Q6.

	Answer	Acceptable answers	Mark
(i)	 connected in parallel with lamp (1)	recognisable symbol such as a box with letter V inside or box with the word voltmeter inside it accept voltmeter across both lamp and ammeter	(1)

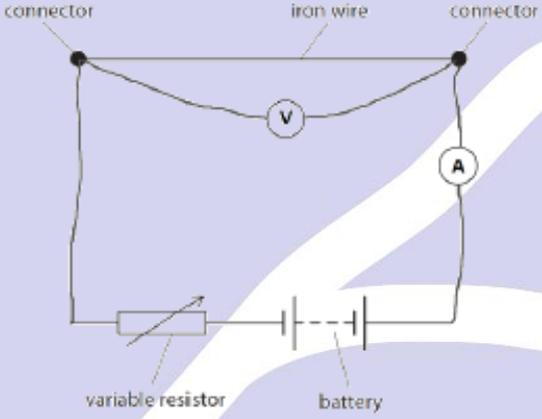
Q7.

Question number	Answer	Additional guidance	Mark
(i)	 <p>voltmeter in parallel across resistor (1)</p> <p>second resistor in parallel (1)</p>		(2)

Q8.

Question number	Answer	Additional guidance	Mark
	<p>a complete circuit diagram with</p> <p>a correct symbol for a variable resistor added in series with a lamp (1)</p> <p>ammeter connected in series with a lamp (1)</p> <p>voltmeter added in parallel with a lamp (1)</p>	<p>allow inclusion of this lamp symbol in series with the power supply </p> <p>allow potential divider or potentiometer alternative</p> <p>allow ammeter and voltmeter symbols to be shown in square boxes</p> <p>example:</p> 	(3) AO1.2

Q9.

Question number	Answer	Additional guidance	Mark
	<p>voltmeter connected in parallel with the iron wire / any part of the iron wire (1)</p> <p>ammeter connected in series with the iron wire (1)</p> <p>example:</p>  <p>The diagram shows a rectangular circuit loop. At the top, a horizontal wire is labeled 'iron wire'. A voltmeter symbol (a circle with a 'V') is connected in parallel across this wire. On the right side of the loop, an ammeter symbol (a circle with an 'A') is connected in series. At the bottom, there is a battery symbol and a variable resistor symbol (a rectangle with a diagonal arrow). On the left side, two points are labeled 'connector'. The circuit is completed by vertical wires connecting the top and bottom components.</p>	<p>accept any recognisable symbols.</p> <p>accept symbol drawn over connecting wire</p> <p>do not credit the same type of meter shown in contradictory positions</p>	<p>(2) AO1</p>

Q10.

Question number	Answer	Additional guidance	Mark
	<p>a diagram of a circuit including all of the following: power supply / cell(s) / battery identifiable resistance wire an ammeter a voltmeter (1)</p> <p>plus any two from ammeter in series (1) voltmeter in parallel (1)</p> <p>indication of tapping off / using 50cm of resistance wire (1)</p>	<p>accept symbols</p> <p>accept ohmmeter with resistance wire only</p> <p>ignore lamp(s) / additional resistors</p> <p>allow ohmmeter (across wire) instead of ammeter and voltmeter for 1 mark</p> <p>e.g. (crocodile) clips</p>	<p>(3) A02.2</p>