

Question number	Answer	Notes	Marks
3	(a)	CIRCUIT DIAGRAM – Correct symbols for ammeter, voltmeter and battery; Ammeter in series with cells; Voltmeter in parallel with wire / as shown in photograph;	1 1 1
	(b) (i)	(independent variable) – length (of wire) (dependent variable) - resistance	1
	(ii)	ANY FIVE APPROPRIATE, e.g. Connect the circuit / connect (crocodile) clip to wire; Read ammeter; Read voltmeter; For known /particular / quoted value length; measure length with a ruler; Repeat readings / average (in different places along the wire); Take readings for different lengths; Check meters for zero errors; Disconnect/switch off between readings; To avoid heating the wire;	5
		ALLOW three separate cells in series ALLOW anything reasonable for the wire (e.g. straight line, variable resistor, resistor)	
		BOTH NEEDED IGNORE references to calculating resistance, plotting graphs –	