Electricity Past Paper Answers Edexcel Physics IGCSE -Higher
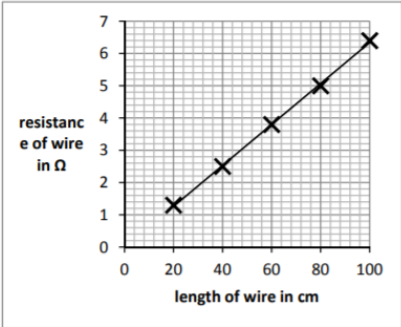
1.

Question number			Answer	Notes	Marks
1 (a)	(i)		A		1
	(ii)		B		1
(b)	(i)		C		1
	(ii)		nearest above (DOP)		1
	(iii)		Comment on device – (plastic) insulator / does not conduct;	(double) insulated / no current (through) / cannot become live	1 1
			Comment on user - no risk of shock / electrocution;	No electricity reaches user / person cannot touch live parts	

2.

Question number		Answer	Notes	Marks
(a)		CIRCUIT DIAGRAM – Correct symbols for ammeter, voltmeter and battery;	ALLOW three separate cells in series	1
		Ammeter in series with cells;	ALLOW anything reasonable for the wire (e.g. straight line, variable resistor, resistor)	1
		Voltmeter in parallel with wire / as shown in photograph;		1
(b)	(i)	(independent variable) – length (of wire) (dependent variable) - resistance	BOTH NEEDED	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;	IGNORE references to calculating resistance, plotting graphs –	5

Question Number		Answer	Notes	Marks
(c)	(i)	Voltage = current x resistance;	ALLOW standard symbols, V = I X R ALLOW correct rearrangements DO NOT ALLOW equation given as unit symbols	1
	(ii)	6.4;	ALLOW correct answer if it follows an equation given in unit symbols IGNORE s.f. BUT must be correctly rounded from 6.4285...	1

Question Number	Answer	Notes	Marks
(d) (i)	Sample graph – scale; at least half the paper axes labelled including units; Plotting; Plotting; Best fit line;	 20 1.3 40 2.5 60 3.8 80 5.0 100 (6.4) Points to plot IF AXES REVERSED, LOSE THE AXES MARK Ignore (100 cm, 6.4) ALLOW as length increases resistance increases ALLOW conclusions in terms of resistance per metre etc	5

Question Number	Answer	Notes	Marks
(d) (ii)	MARK (ii) and (iii) together, credit points wherever seen (directly) proportional;	IGNORE 'as length increases current decreases' / conclusions relating to current	1
MARK tog With			
		ALLOW constant gradient ALLOW positive correlation	1
(iii)	any TWO of Straight line; Through (0,0); line slopes upwards; quoting appropriate values from the graph;		
			1
		Total	**19**

3.

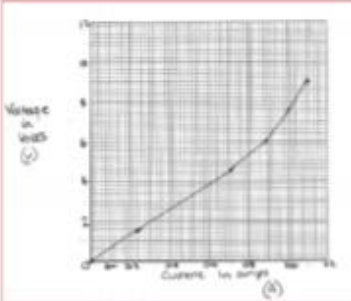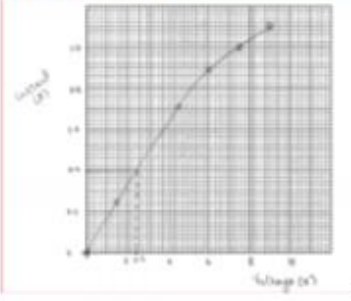| Question number			Answer	Notes	Marks
3	(a)	(i)	power = voltage x current;	Accept rearrangements and symbols e.g. current = power ÷ voltage, P=IV, I=P/V ignore a triangle mnemonic an eqn in units	1
		(ii)	2.9 (A);	Accept 2.92 (A), 2.916 (A)	1
	(b)	(i)	Any **three** of : MP1. if current gets too high/exceeds 13A or a set value; MP2. fuse (wire) melts / breaks; MP3. breaking circuit / switching off; MP4. prevents cable over heating;	allow: fuse blows stops current /flow of electrons	3
		(ii)	any **one** of: MP1. cable can't be fully extended; MP2. limits the use of the extension cable; MP3. can't exceed 1200 W; MP4. can't reach 10.0 (A) / max working value/eq; **AND** (because otherwise) 5 A fuse will blow/ will cut the power;	allow RA ignore vague comments re energy or power being too much or too high	2
		(iii)	(to prevent) the cable overheating/OWTTE;		1

Total 8 marks

4.

Question number	Answer	Notes	Marks
(a)	B (no earth connection);		1
(b)	C (the circuit cannot overheat if there is a fault);		1
(c)	A (in parallel);		1

Total 3 marks

5.

Question number	Answer	Notes	Marks
(a)	any 3 mistakes identified from MP1. cells are connected with wrong polarity; MP2. ammeter is connected in parallel (with wire); MP3. voltmeter is connected in series (with wire); MP4. circuit has not got a switch;	allow RA for any MP allow idea that meters should be swapped for two marks (MP2 and MP3)	3
(b) (i)	suitable scale chosen (> 50% of grid used); axes labelled with quantities and unit; plotting correct to nearest half square (minus one for each plotting error) ;; line of best fit through zero; = 4 not curve mark = 5	only scales in 1,2,5,10 or 8 acceptable orientation unimportant points must be shown clearly i.e. two plotting errors = no marks for plotting i.e. smooth curve | I	V
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0.0	0.
0.2	1.
0.7	4.
0.8	6.
1.0	7.
1.1	9.		5
(ii)	0.40 A	range 0.39 A to 0.41 A	1
(iii)	One of - MP1. Temperature (of wire) was not constant; MP2. Resistance (of wire) was not constant;		1

Question Number	Answer	Notes	Marks
(b) (iv)	Any four of - MP1. instrument to measure temperature; MP2. means to maintain constant temperature (of wire); MP3. use of $V = IR$; MP4. idea of repeating / averaging (at same temperature); MP5. idea of additional (interpolated) points; MP6. use linear part of the graph; MP7. use of gradient;	ignore all details about the circuit already given e.g. water bath, switch off and allow wire to cool $V \propto I$ obtain a range of values (of V, I) Allow reference to candidate's graph, e.g. current below 0.6 A Orientation unimportant	4

Total 14 marks