Practice Question Set For GCSE
Subject : Physics
Paper-2 Topic :10_Electricity And Circuits

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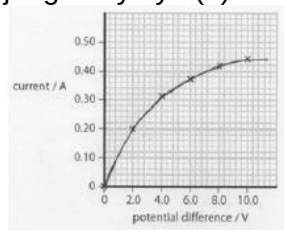
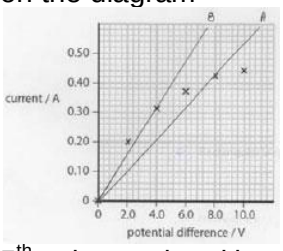
Name of the Student:_____
Max. Marks : 26 Marks **Time : 26 Minutes**

Mark Schemes

Q1.

	Answer	**Acceptable answers**	**Mark**
(i)	both points correct (1)	allow + / - half square	**(1)**
(ii)	curve of best fit judged by eye (1) 	Must pass through zero and two other points. 5th point can be either (8.0,0.42) or (8.0, 0.44) straight line of best fit through origin tolerance between lines A and B shown on the diagram  5th point can be either (8.0,0.42) or (8.0, 0.44)	**(1)**

Q2.

	Answer	**Acceptable answers**	**Mark**
	An explanation linking: electrons (1) colliding with / bumping into ions in the lattice /atoms in the metal (1)	colliding with other electrons If no other marks scored, allow for 1 mark for "electrical energy transferred/changed into thermal/heat energy" do not allow energy being	**(2)**

		created or produced	

Q3.

	Answer	Acceptable answers	Mark
	Substitution 12 × 230 (1) evaluation 2800 (W) (1)	2760 (W) give full marks for correct answer, no working Power of 10 error max. 1 mark.	**(2)**

Q4.

Question Number	Answer	Acceptable answers	Mark
(a)	**A** - 1 joule per coulomb		**(1)**

Question Number	Answer	Acceptable answers	Mark
(b)(i)	Substitution (1) 1800 = 230 x I Transformation (1) I = 1800 / 230 Evaluation (1) 7.8 (A) substitution and transposition can be in either order	current = power / pd Any value which rounds to 7.8 such as 7.8261 Allow full marks for correct answer with no working shown	**(3)**

Question Number	Answer	Acceptable answers	Mark
(b)(ii)	Using E = I x V x T: Substitution (1) 7.8 x 230 x 2 (x 60) Evaluation(1) 220 000 (J) (note: incorrect conversion of time loses the evaluation mark)	Allow ecf from 2(b)(i) Using energy = power x time 1800 x 2 (x 60) (1) Values which round to 220 000 such as 216 000 (J) 215 280 (J) Allow correct conversion to MJ or kJ Allow full marks for correct answer with no working shown	**(2)**

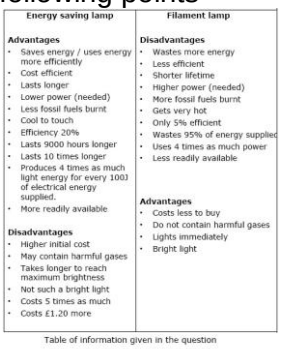
Question Number	Answer	Acceptable answers	Mark
(b)(iii)	An explanation linking two from Energy is transferred (1) (as a result of) collisions of electrons (1) with ions/atoms / lattice (1)	electrons collide with each other for 2 marks	**(2)**

(Total for Question = 8 marks)

Q5.

	Answer	**Acceptable answers**	**Mark**
(a)	☒ **B** charge		**(1)**
(b)	Substitution 12 × 230 (1) evaluation 2800 (W) (1)	2760 (W) give full marks for correct answer, no working Power of 10 error max. 1 mark.	**(2)**
(c)	Conversion 0.4 (kW) (1) Substitution 0.4 × 10 ×15	give marks for correct answer, no working 60(p) or £0.6 (3)	**(3)**

	(p) (1) or 0.4 × 10 × 0.15 (£) Evaluation 60(p) or £0.6 (1)	60,000(p) or £600 (2) 6 to any other power of 10 (1) (400/40/4) × 10 × (15/0.15) gains one mark if no mark can be awarded for evaluation.	

		Indicative Content	**Mark**
QWC	***(d)**	A discussion including some of the following points  **Energy saving lamp** **Advantages** • Saves energy / uses energy more efficiently • Cost efficient • Lasts longer • Lower power (needed) • Less fossil fuels burnt • Cool to touch • Efficiency 20% • Lasts 9000 hours longer • Lasts 10 times longer • Produces 4 times as much light energy for every 100J of electrical energy supplied. • More readily available **Disadvantages** • Higher initial cost • May contain harmful gases • Takes longer to reach maximum brightness • Not such a bright light • Costs 5 times as much • Costs £1.20 more **Filament lamp** **Disadvantages** • Wastes more energy • Less efficient • Shorter lifetime • Higher power (needed) • More fossil fuels burnt • Gets very hot • Only 5% efficient • Wastes 95% of energy supplied • Uses 4 times as much power • Less readily available **Advantages** • Costs less to buy • Do not contain harmful gases • Lights immediately • Bright light Table of information given in the question Energy saving lamp: power =15 W; Cost = £1.50; Lifetime = 10 000 hours; Produces 20J of light energy for every 100J of electrical energy supplied Filament lamp: power =60W; Cost = £0.30; Lifetime = 1000 hours; Produces 5J of light energy for every 100J of electrical energy supplied	**(6)**
Level	**0**	No rewardable content	
1	**1 - 2**	• A limited description of one advantage or one disadvantage e.g. energy saving lamps last a long time/ filament lamps get very hot **OR** A correct value quoted from information with no comparison. • The answer communicates ideas using simple language and uses limited scientific terminology • Spelling, punctuation and grammar are used with limited accuracy	
2	**3 - 4**	• A simple description of two different advantages / disadvantages e.g. energy saving lamps cost more but last longer / filament lamps have a short life time and use more power **OR** Correct values quoted from table and used to provide two comparisons without calculations • the answer communicates ideas showing some evidence of clarity and organisation and uses scientific terminology appropriately • spelling, punctuation and grammar are used with some accuracy	

3	**5 - 6**	• A detailed description of two different advantages / disadvantages using a **quantitative** comparison. e.g. energy saving lamps cost 5 times more but last 10 times longer. / Energy saving lamps produce 4 times as much light energy for every 100J of electrical energy supplied and are much more efficient. / Energy saving lamps last 9,000 hours longer than and they use less power. • the answer communicates ideas clearly and coherently uses a range of scientific terminology accurately • spelling, punctuation and grammar are used with few errors