Electrical Quantities

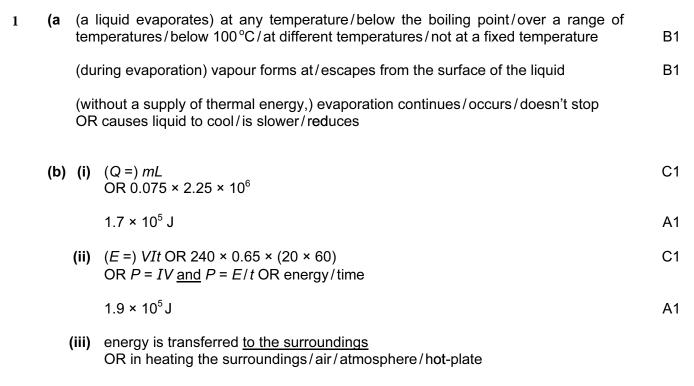
Mark Scheme 5

Level	IGCSE
Subject	Physics
ExamBoard	CIE
Topic	Electricity and Magnetism
Sub-Topic	Electrical quantities
Paper Type	(Extended) Theory Paper
Booklet	Mark Scheme 5

Time Allowed: 56 minutes

Score: /47

Percentage: /100



[Total: 8]

2	(a	(i)	negative at LH end and positive at RH end	B1	
		(ii)	(+ve) charge on A attracts electrons/-ve charges/-ve ions OR unlike charges attract (ignore reference to + charges) electrons move to end X/towards A (unbalanced) +ve charges (left) at end Y NOT repelled to Y	B1 B1 B1	
		(iii)	idea that each electron leaves behind an equal unbalanced proton in nucleus/B has no net charge/B is neutral/idea that B has not gained or lost any charges	B1	
((b)		nothing OR nothing implied	B1	
		(ii)	+ve charge cancelled/neutralised by electrons/negative charges flowing up from earth	B1 B1	
				[Total: 8]	
3	(a	•	e) Pt symbols or numbers OR 100 × 13 × 3600 OR 0.1 × 13 OR 3 960 000 OR 4 320 000 30 000 J OR 4.68 MJ OR 1.3 kWh OR 1300 Wh	C1 A1	
((b)	EIT	HER		
			P/V in any form OR P/V OR 100/250 OR 0.4 A	C1	
			It OR 0.4 × 13 × 3600 OR candidate's current × 13 × 3600 candidate's current × candidate's time in s	C1	
		18 720 C e.c.f			
		OR			
		468	s = joules/coulombs in any form 0000/250 OR candidate's E/250 720 C e.c.f	C1 C1 A1	
((c)	(los	t as/changed to) heat/light OR lost to air/surroundings	B1	
				[Total: 6]	

4	(a increases (as current increases) at an increasing rate			M1 A1
	(b)	$25~\Omega$		B1
	(i	ii) <i>IR</i> in any form OR 0.070 x 25 1.7/1.8 V		C1 A1
	(ii	ii) $(P =) IV$ OR I^2R OR V^2/R in any form, numbers, symbols or words 0.12 W e.c.f. from (i)/(ii)		C1 A1
	(c)	answer to (b)(ii)		B1
	(i	ii) use of $1/R = 1/R_1 + 1/R_2$ OR $R = R_1R_2/(R_1 + R_2)$ 12.5 Ω		C A1
			[T	otal: 10]
5	. ,	bring rod close but not touching plate touch metal plate with earth lead remove lead and then rod	M1 M1 A1	3
	(b)	(i) $Q = 20 \text{ (mA)} \times 15 \text{ (s)}$ = 0.30 C	C1 A1	
		(ii) $V = 20 \text{ (ma)} \times 10 \text{ (k}\Omega)$ = 200 V	C1 A1	M3 [6]

6	(a)	force is produced	B1	
		on any charge placed in the field	B1	[2]
	(b)	at least 3 parallel, straight lines plate to plate, ignore end effect	B1	
		at least one correct arrow, none wrong	B1	[2]
	(c)	$q = It \text{ or } 0.06 = I \times 30$	C1	101
		I = 0.002 A or 2 mA	A1	[2]
	(d)	E = Vit	C1	
		= 1500 x 0.008 x 10	C1	
		= 120 J	A1	[3]
				Total [9]