SERIES AND PARALLEL CIRCUITS MARK SCHEMES 1

QUESTION 1

QUESTION	ANSWER	EXTRA INFORMATION	MARKS
a)i)	24(V)		1
a)ii)	current always flows in the same direction or current only flows one way		1
b)i)	more power / force needed work done to lift the scooter uphill or work done against gravity	accept energy transformed faster accept it moves against gravity accept energy is transformed to gravitational potential energy	1 1
b)ii)	reduces it		
c)	375	1 mark for correct substitution 1 mark for an answer = 250 1 mark for an answer = 125	2
d)	86400 coulomb	1 mark for correct substitution 1 mark for an answer = 43200 answer 24 gains 1 mark answer 24 Ah gains 2 marks answer 12 Ah gains 1 mark only accept C	2 1
Total marks			10

QUESTION 2

QUESTION	ANSWER	EXTRA INFORMATION	MARKS
a)i)	30	allow 1 mark for showing correct method i.e. 5 × 6 or 12 ÷ 0.4	2
a)ii)	connected in series	insufficient they are not connected in parallel	1
a)iii)	0.4		1
a)iv)	equally/ evenly	the same is insufficient allow credit for candidates that correctly mention pd across the connecting wires accept (nearly) 2 V (each)	1
b)	48 coloumbs	do not accept e.c.f. if (a) (iii) = 12 or 5 accept their (a) (iii) × 120 correctly calculated for both marks allow 1 mark for correct substitution and conversion of time to seconds i.e. charge = 0.4 × 120 an answer 0.8 scores 1 mark allow 1 mark for their (a) (iii) x 2 correctly calculated accept C do not accept c do not accept amp seconds	2 1
Total marks			8

QUESTION 3

QUESTION	ANSWER	EXTRA INFORMATION	MARKS
a)i)	0.25 (A)		1
a)ii)	75 coulombs or C	allow 1 mark for converting 5 minutes to 300 seconds or allow 1 mark for correct substitution ie 0.25 × 300 allow 1 mark for an answer 1.25 allow 1 mark only for their (a)(i) × 300 correctly calculated do not accept c	2 1
b)	any two from: • fault not repaired • larger current will (still) flow • aluminium foil will not melt (if a fault) • wiring will overheat / (may) cause a fire	accept if a fault was to occur accept aluminium foil needs a higher current / charge to melt accept idea of fire hazard do not accept explode etc	2
Total marks			6

Q UESTION 4

Q UESTION	Answer	Extra information	Marks
a)i)	c		1
a)ii)	6 volts	accept their (a)(i) ignore any units	1
b)	0.30	Accept 0.3	1

c)	smaller(than) a bigger current flows through the lamp	accept correct alternatives to smaller than e.g. less than only accept if 'smaller than' is given accept converse accept a correct calculation accept resistance is half of 60 accept resistance = 30 (Ω) do not accept answers in terms of p.d	1 1
Total marks			5

Q UESTION 5

Q UESTION	ANSWER	EXTRA INFORMATION	MARKS
a)	switch	Allow answer circled in box	1
b)	24		1
c)	Equal to 0.25		1
d)	4		1
Total marks			4

QUESTION 6

QUESTION	ANSWER	EXTRA INFORMATION	MARKS
	L N M K	all four in the correct order 2 marks for 2 correct 1 mark for 1 correct	3
Total marks			3