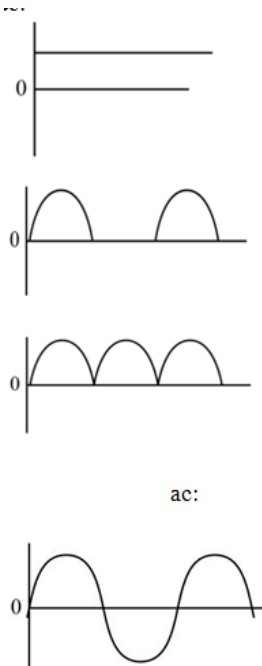


Current Voltage and Power 1

Mark Schemes

QUESTION 1

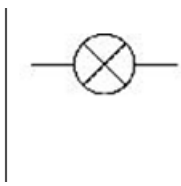
QUESTION	ANSWER	EXTRA INFORMATION	MARKS
a)	d.c. flows in (only) one direction a.c. changes direction (twice every cycle)	accept a.c. constantly changing direction ignore references to frequency accept answers presented as a clear diagram e.g. 	1 1
b)i)	210	transformation and substitution i.e. $\frac{2.3}{230}$ or $\frac{2300}{230}$ an answer 0.01 gains 1 mark allow 1 mark for correct	2
b)ii)	13	e.c.f.	1

		accept the fuse size that is the next listed value greater than answer (b)(i)	
Total marks			5

QUESTION 2

QUESTION	ANSWER	EXTRA INFORMATION	MARKS
a)	voltmeter	and no other do not accept voltage	1
b)i)	variable resistor		1
b)ii)	0.10 – 0.30	accept 0.1 – 0.3 accept 0.3 – 0.1 accept 0.30 – 0.10	1
b)iii)	3.3(W)	allow 1 mark for correct data choice allow 2 marks for substitution of correct data i.e. 0.30×11.0 the following answers gain 2 marks 0.10 / 0.30 / 0.80 / 1.75 allow 1 mark for substitution of incorrect of data incorrectly calculated e.g. $0.20 \times 4.0 = 0.6$ scores 1 mark	3
c)	increases		1
Total marks			7

QUESTION 3

QUESTION	ANSWER	EXTRA INFORMATION	MARKS
a)		accept 'the humpback bridge' symbol accept circle with cross but no lines if more than one symbol drawn, no mark unless lamp is labelled	1
b)i)	24	allow 1 mark for correct substitution	1

		ie 2880/120 allow 1 mark for an answer 1440 ignore any unit	
b)ii)	watt		1
c)	Larger than	accept correct indication inside the box accept an answer meaning larger than ie greater than	1
Total marks			5

QUESTION 4

QUESTION	ANSWER	EXTRA INFORMATION	MARKS
a)	35	an answer with more than 2 sig figs that rounds to 35 gains 2 marks allow 2 marks for correct method, ie 230/6.5 allow 1 mark for $I = 6.5$ (A) or $R = 230 / 26$ an answer 8.8 gains 2 marks an answer with more than 2 sig figs that rounds to 8.8 gains 1 mark	3
b)i)	(maximum) current exceeds maximum safe current for a 2.5 mm ² wire or (maximum) current exceeds 20 (A) a 2.5 mm ² wire would overheat / melt	accept power exceeds maximum safe power for a 2.5 mm ² wire (maximum) current = 26 (A) is insufficient accept socket for wire do not accept plug for wire	1
b)ii)	(contains) live, neutral and earth wires cross-sectional area of (live and neutral) wire(s) (minimum of) 4 mm ² wire / cable should be insulated	accept is a three-core cable accept 6 mm ² for 4 mm ² accept a suitable named insulator, eg PVC / rubber / plastic	1 1 1

c)	a.c. is constantly changing direction	accept a.c. flows in two directions accept a.c. changes direction a.c. travels in different directions	1
	d.c. flows in one direction only	is insufficient	1
Total marks			10

QUESTION 5

QUESTION	ANSWER	EXTRA INFORMATION	MARKS
a)i)	50 (Hz)		1
a)ii)	2760 (W)		1
b)	12 amp	allow 1 mark for correct substitution, ie 2400/200 or allow 1 mark for 2760/230 provided no subsequent step shown	2 1
c)	the charge is directly proportional to the time switched on for	accept for 1 mark the longer time (to boil), the greater amount of charge or positive correlation or they are proportional	2
Total marks			7

QUESTION 6

QUESTION	ANSWER	EXTRA INFORMATION	TOTAL MARKS
a)	600	allow 1 mark for correct substitution, ie $P = 30\,000/50$ provided no subsequent step	2
b)	power is greater than 820 (W) the lead /cable / wire will overheat / get (too) hot so there is a risk of fire	power is 1200 W is insufficient accept lead / cable will melt may overheat / get hot is insufficient accept causing a fire	1 1 1
c)	X	mark only scores if X is chosen	1

	any one from: <ul style="list-style-type: none"> • most / more efficient • smallest energy input (per second) • cheapest to operate 	mark is for the reason accept smallest input (power) for same output (power) accept wastes least energy smallest (power) input is insufficient uses least electricity is insufficient	
Total marks			6