

Q1. (2018)

02.2		an answer of 7.254 scores 2 marks		
	$P = 3.90 \times 1.86$		1	AO2 6.2.4.1
	$P = 7.254$	allow 7.25 or 7.3	1	AO2 6.2.4.1
	W		1	AO1 6.2.4.1

Q2. (2018)

02.3	comparison with compact power source			AO3 6.2.4.2
	5 times as many charges		1	
	(only) twice the mass	allow (only) twice as heavy as the compact	1	
	comparison with the high capacity power source			
	although half the number of charges		1	
	(only) one third the mass	allow (only) a third as heavy as the high capacity	1	
	or			
	calculation of charge / mass ratio for large power source	allow mass / charge ratio		
	$= \frac{5}{200} (1)$	$= \frac{200}{5}$		
	$= 0.025 (1)$	allow 40		
	calculation of charge / mass ratio for high capacity and compact power sources (1)	allow mass / charge ratio		
	charge / mass ratio greatest for large source (1)	allow lowest mass / charge ratio		

Q3. (2018)

04.1	(casing is) not made of metal	allow (casing is) made of plastic allow they are double insulated	1	AO3 6.2.3.2
	little / no chance of electric shock		1	

Q4. (2018)

04.5			1	AO1 6.2.1.1
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Q5. (2019)

a)

01.5		an answer of 0.016 (W) scores 2 marks		AO2.1	E
	power = 0.80×0.020		1	6.2.4.1	
	power = 0.016 (W)		1	WS 3.3	
b)					
01.6	power = (current) ² × resistance		1	AO1.1 AO1 in isolation	A
				6.2.4.1	
c)					
01.7	temperature increases		1	AO1.1	E
				6.1.1.1	

Q7. (2019)

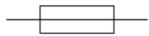
a)					
05.1	to stop the metal case of the toaster becoming live if a fault occurs		1	AO1.1	A
				6.2.3.2	
b)					
05.2	yellow		1	AO1.1	G
	brown		1	AO1 in isolation	
	blue		1	6.2.3.2	
c)					
05.3		an answer of 102 000 (J) scores 2 marks		AO2.1	E
	E = 850×120		1	6.2.4.2	
	E = 102 000 (J)		1	6.1.1.4 WS 3.3	

Q8. (2020)

01.6	power = 0.32×0.50		1	AO2	
	power = 0.16 (W)		1	6.2.4.1	

Q9. (2020)

a)					
05.1	swap the blue wire and the green and yellow wire	allow connect the blue wire to the neutral pin and the yellow and green wire to the earth pin.	1	AO2	
		allow swap the earth and neutral wires		6.2.3.2	
		ignore the earth wire and neutral wire are wrongly connected			
b)					

05.2	230 (V)		1	AO1
	50 (Hz)		1	6.2.3.1 6.2.3.2
c)				
05.3	0 (V)		1	AO1 6.2.3.2
d)				
05.4			1	AO1 6.2.1.1
e)				
05.5	the person could get an electric shock	allow so the person could be electrocuted	1	AO3 6.2.3.2
	because there is a current in the person	allow because the person provides a connection (from the washing machine) to earth allow because there is a potential difference across the person	1	
f)				
05.6	the charge flows through the earth wire (instead of the person)		1	AO3 6.2.3.2
	because the resistance of the earth wire is much less than that of a person	allow so the case does not become live allow so the fuse will break / melt / blow	1	

Q10. (2021)

03.5	$P = 0.75 \times 0.16$		1	AO2
	$P = 0.12 \text{ (W)}$		1	6.2.4.1

Q11. (2021)

a)

05.3	energy = power $\times$ time		1	AO1 6.2.4.2
	or			
	$E = P t$			

b)

05.4	time = 150 000s		1	AO2 6.2.4.2
	energy = $0.46 \times 150\,000$	allow a substitution using an incorrectly/not converted value of time	1	
	energy = 69 000 (J)	allow a correct calculation using an incorrectly/not converted value of time	1	

Q12. (2022)

01.5	$P = 4.8 \times 0.75$		1	AO2 6.2.4.1
	$P = 3.6$ (W)		1	

Q13. (2022)

a)

06.3	power = $\frac{\text{energy transferred}}{\text{time}}$		1	AO1 6.1.1.4 6.2.4.2 RPA14
	or			
	$P = \frac{E}{t}$			

b)

06.4	$50 = \frac{4750}{t}$		1	AO2 6.1.1.4 6.2.4.2
	or			
	$4750 = 50 \times t$			
	$t = \frac{4750}{50}$		1	
	$t = 95$ (s)		1	

Q14. (2022)

a)

06.5	thermistor		1	AO1 6.2.1.4
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b)

06.6	250 (Ω)	allow an answer in the range 240 (Ω) to 260 (Ω) allow 1 mark for temperature = 160 ($^{\circ}\text{C}$)	2	AO3 6.2.1.4
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Q15. (2023)

a)

04.6	power = potential difference × current		1	AO1 6.2.4.1
	or			
	$P = VI$			

b)

04.7	$2900 = 230 \times I$		1	AO2 6.2.4.1
	$I = \frac{2900}{230}$		1	
	$I = 12.6 \dots$ (A)	allow 13 (A)	1	

Q16. (2024)

01.3	$P = 1.5 \times 1.2$		1	AO2 6.2.4.1
	1.8 (W)		1	

Q17. (2024)

a)

06.2	power = $\frac{\text{work done}}{\text{time}}$		1	AO1 6.1.1.4
	or			
	$P = \frac{W}{t}$			

b)

06.3	$92 = \frac{23\,000}{\text{time}}$		1	AO2 6.1.1.4
	$\text{time} = \frac{23\,000}{92}$		1	
	250 (s)		1	

c)

06.4	$P = I^2 R$		1	AO1 6.2.4.1
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d)

06.5	$I = 0.500 \text{ A}$		1	AO2 6.2.4.1
	$P = 0.500^2 \times 640$	allow a correct substitution of an incorrectly / not converted current	1	
	$P = 160 \text{ (W)}$	allow a correct calculation using an incorrectly / not converted current	1	

e)

06.6	230 (V)		1	AO1 6.2.3.2
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