

Q1. (2019)

02.2		an answer of 0.0021(212121...) scores 3 marks		AO2.1 6.3.2.2 6.1.1.3	E
	0.70 = m × 330 or 700 = m × 330 000		1		
	$m = \frac{0.70}{330}$ or $m = \frac{700}{330\,000}$	allow correct rearrangement using converted value(s) of E to J and/or L to J/kg	1		
	m = 0.0021 (kg)	allow 0.0021(212121...) allow correct calculation using converted value(s) of E and/or L	1		
		3 marks can only be awarded for m = 0.0021(212121...) (kg)			

Q2. (2020)

05.5	165 kJ = 165000 J		1	AO2 6.3.2.2 6.3.2.3 6.1.1.3	
	$\Delta E = m \times 3500 \times 21.5$ and $\Delta E = m \times 255000$		1		
	165000 = 75250 m + 255000 m or 165000 = 330250 m	this mark may be awarded if E is incorrectly/not converted	1		
	$m = \frac{165000}{75250 + 255000}$ or $m = \frac{165000}{330250}$	this mark may be awarded if E is incorrectly/not converted	1		
	m = 0.499621 (kg)	allow an answer consistent with their value of E	1		
	m = 0.50 (kg)	this answer only	1		
		If no marks awarded other than the first marking point: either 165 000 = m × 3500 × 21.5 scores 1 mark m = 2.192... scores 1 mark m = 2.2 (kg) scores 1 mark. these marks may be awarded if E is incorrectly/not converted or 165 000 = m × 255 000 scores 1 mark m = 0.647 scores 1 mark m = 0.65kg scores 1 mark. these marks may be awarded if E is incorrectly/not converted			

Q3. (2021)

06.2	latent heat (of vaporisation)	allow specific latent heat (of vaporisation)	1	AO1 6.3.2.3
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Q4. (2022)

02.1	Level 3: The method would lead to the production of a valid outcome. All key steps are identified and logically sequenced.	5–6	AO1 6.1.1.3 6.3.2.2 RPA14
	Level 2: The method would not necessarily lead to a valid outcome. Most steps are identified, but the plan is not fully logically sequenced.	3–4	
	Level 1: The method would not lead to a valid outcome. Some relevant steps are identified, but links are not made clear.	1–2	
	No relevant content	0	
	Indicative content <ul style="list-style-type: none"> • measure mass of oil using the top pan balance • measure start temperature of oil using the thermometer • place beaker of oil on heater • switch on heater to heat oil • measure final temperature of oil using the thermometer • measure energy transferred using joulemeter • calculate increase in temperature ($\Delta\theta$) • use the equation $E = mc\Delta\theta$ to determine c 		