Question Number	Answer		Mark
14(a)	Determine V using given dimensions	**(1)**	**3**
	Use of $\rho = \frac{m}{V}$	**(1)**	
	$m = 0.022$ (kg) [min 2sf]	**(1)**	
	Example of calculation $V = (2.5 \times 10^{-2}\text{m})^2 \times 3.5 \times 10^{-2}\text{m} = 2.19 \times 10^{-5}\ \text{m}^3$ $1.00 \times 10^3 \text{kg m}^{-3} = \frac{m}{2.19 \times 10^{-5}\ \text{m}^3}$ $\therefore m = 0.0219$ kg		
14(b)	Use of $\Delta E = mc\Delta\theta$	**(1)**	**4**
	Use of $\Delta E = mL$	**(1)**	
	Use of $P = \frac{\Delta E}{\Delta t}$	**(1)**	
	P = 79 W so not 110 W [Use of show that value for m gives 71 W] (allow ecf from (a)) **Or** t = 8.5 min not 12 mins so the energy is not transferred at a rate of 110 W [Use of show that value for m gives 7.8 min (467 s)] (allow ecf from (a)) **Or** $\Delta E = 7.92 \times 10^4$J not 5.65×10^4 J so the energy is not transferred at a rate of 110 W [Use of show that value for m gives 4.06×10^4 J] (allow ecf from (a))	**(1)**	
	Example of calculation $\Delta E = 6 \times 0.022\ \text{kg} \times 4180\ \text{J kg}^{-1}\ \text{K}^{-1} \times 22.5\ \text{K} = 1.24 \times 10^4\ \text{J}$ $\Delta E = 6 \times 0.022\ \text{kg} \times 3.34 \times 10^5\ \text{J kg}^{-1} = 4.41 \times 10^4\ \text{J}$ $P = \frac{(1.24 \times 10^4 + 4.41 \times 10^4)\text{J}}{(12 \times 60)\ \text{s}} = \frac{5.65 \times 10^4}{720} = 78.5\ \text{W}$ **Or** $t = \frac{(1.24 \times 10^4 + 4.41 \times 10^4)\text{J}}{110\ \text{W}} = 514\ \text{s} = 8.5\ \text{min}$ **Or** $\Delta E = 110\ \text{W} \times (12 \times 60)\text{s} = 7.92 \times 10^4\text{J}$		
	Total for question 14		**7**