

Question number	Answer	Notes	Marks
4 (a)	temperature difference calculated; substitution into given formula; correct evaluation; e.g. $\Delta T = 100 - 16 = 84 \text{ (}^\circ\text{C)}$ energy supplied = $0.45 \times 4200 \times 84$ (energy supplied =) 160 000 (J)	e.g. 84 seen or 100 - 16 seen allow ecf for incorrect temperature <u>difference</u> 158 000 (J) scores 2 marks only allow 159 000, 158 760 (J)	3
(b) (i)	$(7.4 - 3.0) = 4.4$ (minutes);	allow 4 minutes and 24 seconds, 4 and $\frac{4}{10}$ minutes	1
(ii)	conversion of time into seconds; substitution into $P = W/t$ OR rearrangement; correct evaluation; e.g. time = 264 (s) $2200 = W / 264$ OR $W = P \times t$ energy supplied = 580 000 (J)	allow ECF from (i) allow ECF from (i) allow substitution in minutes 9700, 9680 (J) scores 2 marks allow 581 000, 580 800 (J)	3
(c)	idea of all water being the same temperature;	allow idea of distributing thermal/heat (energy) evenly throughout water	1
(d)	arrangement idea that liquid has molecules that are close together; idea that gas has (widely) spaced molecules; motion idea that liquid has molecules that move/slide past each other; idea that gas has molecules that move {faster/freely/randomly/straight lines};	allow marks if seen on diagrams allow particles for molecules ignore random/irregular arrangement for liquid and gas	4

Total for Question 4 = 12 marks