(b)	(i)	period represented by 4 squares; correct use of x-scale; correct evaluation; e.g. period = 4 squares period = 4 × 5.0 ($\times 10^{-3}$) period = 20 ms = 2.0 × 10^{-2} (s)	 allow ECF from wrong number of squares if clear in working -1 POT error answer of 0.01, 0.04 (s) scores 2 marks allow 0.02 (s)	3
	(ii)	substitution into given formula; correct evaluation; e.g. frequency = 1 / 0.02 frequency = 50 (Hz)	allow ECF from (i)	2

Total for Question 2 = 10 marks

Question number	Answer	Notes	Marks
4 (a)	temperature difference calculated; substitution into given formula; correct evaluation; e.g. $\Delta T = 100 - 16 = 84$ (°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 difference 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 $^4/_{10}$ 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 × 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