

Question number	Answer	Notes	Marks
6 (a)	any five from: MP1. measure temperature increase; MP2. measure time taken; MP3. allow temperature to rise to maximum after heater switched off; MP4. calculate total energy / use of $E = P \times t$; MP5. measure <u>mass</u> of water; MP6. (by) finding difference between empty beaker and 'beaker + water' MP7. use of $E = m \times c \times \Delta\theta$; MP8. plot a temperature-time graph; MP9. use gradient (so $c = P / (m \times \text{gradient})$;	accept measure initial and final temperature allow a stated time period	5
(b) (i)	temperature difference calculated; substitution; evaluation; e.g. $(\Delta T = 65 - 16 =) 49 (^{\circ}\text{C})$ $\Delta Q = 75 \times 4200 \times 49$ $(\Delta Q =) 15\,000\,000 \text{ (J)}$	allow 49, 65-16 seen allow ecf from clear incorrect temperature difference allow 15 MJ allow correct answers to other significant figure values i.e. 15 435 000 (J)	3
(ii)	any three from: MP1. idea that energy/heat lost by water is approximately equal to energy gained by air; MP2. (some) thermal energy lost to the surroundings; MP3. air and water have a different specific heat capacity; MP4. air has a smaller heat capacity than water; MP5. valid attempt to show algebraically; MP6. correct algebraic attempt;	allow $(\Delta)Q$ is the same for both allow other named object e.g. radiator, walls etc. also scores MP3	3

Total for Question 6 = 11 marks