

Question number	Answer	Notes	Marks
4 (a) (i)	by radiation / by (infrared) light;	ignore "heat" Allow EM waves/IR, condone visible, UV, sunlight	1
	(ii) (average speed) increases;	condone "light rays" e.g. "faster"	1
(b) (i)	Either idea that water temperature is greater than the outside temperature; Or not receiving radiation / light from the Sun;	allow RA condone 'heat' or 'sunlight' for 'light' or 'radiation'	1
(ii)	any four from: MP1. cover traps air; MP2. (trapped) air is a poor conductor / (good) insulator; MP3. plastic is a poor conductor / (good) insulator; MP4. conduction reduced; MP5. convection reduced / stopped; MP6. less evaporation (from water surface);	ignore reference to radiation ignore 'traps heat' condone "conduction stopped" condone "no evaporation"	4

Total for Question 4 = 7 marks

Question number	Answer	Notes	Marks
6	<p>any six from:</p> <p>MP1. cup slows down/stops energy transfer to surroundings;</p> <p>relating to conduction:</p> <p>MP2. vacuum contains no particles;</p> <p>MP3. reducing/stopping conduction (through the sides);</p> <p>MP4. plastic (lid) is a poor conductor / good insulator;</p> <p>relating to convection:</p> <p>MP5. air is trapped by the lid;</p> <p>MP6. reducing/stopping convection (from the surface);</p> <p>relating to radiation:</p> <p>MP7. (inner) shiny surface is poor absorber of infrared / radiation;</p> <p>MP8. (outer) shiny surface is poor emitter of infrared / radiation;</p> <p>MP9. energy transfer by radiation reduced/stopped;</p>	<p>allow idea that <u>energy</u> is trapped ignore 'heat is trapped'</p> <p>allow reducing/stopping evaporation</p> <p>allow idea that inner surface reflects heat</p>	6

Total for Question 6 = 6 marks

Question number	Answer	Notes	Marks
7	<p>any six from:</p> <p>MP1. cat X loses more energy by conduction / convection than cat Y;</p> <p>MP2. cat Y loses more energy by radiation than cat X;</p> <p>MP3. fur traps air;</p> <p>MP4. larger surface area increases conduction (losses);</p> <p>MP5. air is a (good) insulator/ poor conductor;</p> <p>MP6. fur is a (good) insulator / poor conductor;</p> <p>MP7. trapped air cannot move around;</p> <p>MP8. trapped air reduces convection;</p> <p>MP9. black surfaces are better emitters / emit radiation faster;</p>	<p>allow RA throughout</p> <p>ignore black surfaces being better absorbers</p>	6

Total for Question 7 = 6 marks

Question number	Answer	Notes	Marks
10 (a)	black because it is a better/good absorber; of radiation (from the Sun);	ignore references to emission allow IR, infrared for radiation	2
(b)	any four from: MP1. temperature of air increases; MP2. air expands / air particles move further apart; MP3. density of air decreases; MP4. warm/heated air rises; MP5. cool air replaces warmed air; MP6. process repeats;	allow air particles gain KE reject particles expand reject particles become less dense ignore heat rises allow cool air sinks	4

Total for Question 10 = 6 marks