

Conduction and Convection 3

QUESTION 1

QUESTION	ANSWER	EXTRA INFORMATION	MARKS
a)	convection conduction	correct order only	1 1
Total marks			2

QUESTION 2

QUESTION	ANSWER	EXTRA INFORMATION	MARKS
	conduction 1 convection 3 insulation 4 radiation 2		
Total marks			4

QUESTION 3

QUESTION	ANSWER	EXTRA INFORMATION	MARKS
	decreases 2 increases 1 is unchanged 4 rises 3		
Total marks			4

QUESTION 4

QUESTION	ANSWER	EXTRA INFORMATION	MARKS
a)i)	the outside colour of the cans		1
a)ii)	18 (°C) or 88 to 70	ignore negative sign	1
b)	8 (°C) or 70 to 62	ignore negative sign	1
c)	greater temperature difference between water and surroundings (at	must mention temperature difference	1

	start)	ignore just water hotter accept energy used to heat cans initially	
d)	black temperature falls the fastest (in L) black is a good / the best / better emitter (of heat / radiation)	accept (can L) loses more heat / cools quicker accept heat for temperature accept converse ignore black is best absorber	1 1 1
Total marks			7

QUESTION 5

QUESTION	ANSWER	EXTRA INFORMATION	MARKS
a)	any three from: ☐ (air) particles / molecules / atoms gain energy ☐ (air) particles / molecules / atoms move faster ☐ (air) particles / molecules / atoms move apart ☐ air expands ☐ air becomes less dense ☐ warm / hot air rises	ignore reference to skewer do not accept move more do not accept move with a bigger amplitude / vibrate more do not accept particles expand do not accept heat rises if credit is to be given for answers in terms of particles it must be clear they are air particles not gas particles	3
b)	conduction	accept conductor	1
c)	any one from: ☐ temperature of the potato ☐ temperature of the surroundings / room / surface / atmosphere ☐ size / mass / weight / volume of the potato ☐ shape of the potato ☐ surface area of the potato ☐ nature of the surface of the potato ☐ type of surface it is placed on ☐ in a draught ☐ type of potato ☐ whether the skewers are left in or taken out	do not accept heat for temperature accept how hot the potato / room is potato cut open insufficient	1

d)	(foil) reflects heat (back towards potato) or (foil) is a poor emitter (of heat radiation)	reduces heat loss is insufficient do not accept reflects hot air accept reduces / stops heat loss by radiation do not accept heat is trapped	1
Total marks			6

QUESTION 6

QUESTION	ANSWER	EXTRA INFORMATION	MARKS
a)	the bigger the surface area, the faster the water cools down / temperature falls	answers must imply rate accept heat for temperature provided rate is implied do not accept cools down more unless qualified	1
b)	any two from: the ears: <input type="checkbox"/> have large surface / area <input type="checkbox"/> radiate heat <input type="checkbox"/> keep blood cooler	not just has large ears accept loses heat, but does not score if the reason given for heat loss is wrong	2
c)i)	radiation		1
c)ii)	conduction		1
Total marks			5

QUESTION 7

QUESTION	ANSWER	EXTRA INFORMATION	MARKS
a)	conduction	do not accept conductor	1
b)	the freezer greater temperature difference (between freezer and room)	both parts needed do not accept because it is the coldest	1
c)	any two from: <input type="checkbox"/> poor absorber of heat / radiation <input type="checkbox"/> reflects heat / radiation (from room away from fridge-freezer) <input type="checkbox"/> reduces heat transfer into the fridge-freezer <input type="checkbox"/> reduces power consumption of fridge-freezer	accept does not absorb heat poor emitter of heat / radiation is neutral do not accept it is a bad conductor /good insulator	2
Total marks			4

QUESTION 8

QUESTION	ANSWER	EXTRA INFORMATION	MARKS
a)i)	radiation	ignore thermal / infrared	1
a)ii)	black is a better / good absorber (of heat / radiation) (so) temperature rises faster or white is a worse / poor absorber (of heat / radiation) (1) (so if white faces) temperature would rise slower (1)	ignore reference to black being a good emitter black absorbs heat is insufficient do not accept black attracts / absorbs the Sun do not accept black attracts heat must be an indication of heating up quicker accept white is a better / good reflector (of heat / radiation) ignore any reference to light	1 1
b)i)	1.2 (hours) or 1 hour 12 minutes	no tolerance	1
b)ii)	increases (rapidly at first then increases at a slower rate)	do not accept increases at a steady rate	1
c)i)	any two from: <ul style="list-style-type: none"> • (fill with) same mass / volume / amount of water • same level of (sun)light / sunshine <ul style="list-style-type: none"> • outside for the same (length of) time • outside at same time (of day / year) • initial water temperature • the side of the bag facing the Sun 	accept same heat / light source accept same place do not accept any factors to do with the construction of plastic bags eg thickness	2
c)ii)	curved line drawn above given line	both lines must start from the same point ignore if continues beyond one hour or levels off after 1 hour	1
Total marks			8

QUESTION 9

QUESTION	ANSWER	EXTRA INFORMATION	MARKS
	(a metal has) free electrons	accept atoms / particles for ions throughout	1
	(kinetic) energy of (free) electrons increases	accept mobile for free accept energy of ions increases	1
	(free) electrons move faster or	accept ions vibrate with a bigger amplitude accept ions vibrate more do not accept electrons vibrate more	1
	electrons move through metal (so) electrons transfer energy to other electrons / ions	accept electrons collide with other electrons / ions accept ions transfer energy to neighbouring ions	1
			4