

Controlling Body temperature MS

QUESTION 1

QUESTION	ANSWER	EXTRA INFORMATION	MARKS
a)	<p>if body temperature too high blood vessels supplying skin (capillaries) dilate / widen</p> <p>if body temperature is too low blood vessels supplying skin (capillaries) constrict / narrow</p> <p>so more / less blood flows through skin (capillaries) or nearer the surface of the skin so more / less heat is lost (from the skin by radiation)</p>	<p>do not accept capillaries / veins dilate/constrict</p> <p>do not accept idea of blood vessels moving (through skin) ignore expand</p> <p>accept arteries / arterioles for 'blood vessels'</p> <p>if no reference to skin allow blood vessels dilate and blood vessels constrict for one mark</p> <p>must correctly relate to dilation or constriction</p> <p>must correctly relate to dilation or constriction</p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p>
b)	<p>sweat released cannot evaporate because of high humidity / all the water vapour in the air so less heat lost / less cooling</p> <p>or it is evaporation of sweat that cools the body</p>		<p>1</p> <p>1</p> <p>1</p>
Total marks			7

QUESTION 2

QUESTION	ANSWER	EXTRA INFORMATION	MARKS
a)	<p>brain blood sweat</p>	in correct order only	3
b)i)	A		1
b)ii)	to replace ions lost (in sweat)	<p>accept salts allow named examples, eg. prevent cramps</p>	1

b)iii)	any one from: <ul style="list-style-type: none"> •there is too much glucose / sugar in the sports drink •they shouldn't have too much glucose / blood sugar •it would cause their blood glucose / sugar to rise (too high) 		1
Total marks			6

QUESTION 3

QUESTION	ANSWER	EXTRA INFORMATION	MARKS
a)i)	1 hour 15 mins / 1.25 hours / 75 mins	allow 1:15 ignore 1.15 hours	1
a)ii)	increase in (core / body) temperature (due to an) increase in respiration or more muscle contraction releasing energy (as a waste product) skin temperature decreases (because there is) sweating (which) evaporates and cools the skin	ignore numbers allow produces 'heat' do not allow making energy ignore references to vasodilation or vasoconstriction	1 1 1 1 1
a)iii)	(there is) dilation of vessels (supplying skin capillaries) (so) more blood flows (near skin) (surface) or blood is closer (to the skin)	allow vasodilation allow blood vessels widen ignore expand do not accept dilating capillaries or moving vessels ignore ref to heat	1 1
b)i	pancreas detects (low) blood glucose produces glucagon (so) glycogen is converted to glucose	do not allow glucagon made in the liver allow adrenaline released which increases conversion of glycogen	1 1 1

		to glucose or reduced insulin production so less glucose into cells / less glucose converted to glycogen for 1 mark	
Total marks			12

QUESTION 4

QUESTION	ANSWER	EXTRA INFORMATION	MARKS
a)	respiration	allow muscle contraction or muscle movement or exercise of muscles allow metabolism / chemical reactions	1
b)i)	any two from: ✗ less / no water (available) for sweat ✗ less / no heat lost / less / no cooling ✗ less / no evaporation (of sweat)	allow dehydrated so less sweat allow converse if evident that response refers to athletes who have drunk liquid only need to refer to less / no once	2
b)ii)	either blood vessels supplying the skin or blood vessels in skin dilate / widen / muscles relax	do not allow first mark if implied that skin capillaries dilate ignore enlarge / open vasodilation in skin = 2 marks allow hairs lie flat for 1 mark allow less insulation for 1 mark if linked to hairs allow more blood in skin for 1 mark if no other marks awarded	1 1
c)i)	cold / 15oC cools the body / blood (more)	or reverse argument ignore reference to values for body temperature derived from graph	1
c)ii)	any two from: ✗ cools slower at 15oC cold / 15oC ✗ cold / 15oC causes reduced blood flow to surface / skin ✗ blood not cooled as much / as quickly	allow converse arguments ignore reference to capillaries	2

	<ul style="list-style-type: none"> ✗ cold / 15°C causes shivering ✗ muscles contract / more respiration / heat made 		
Total marks			8

QUESTION 5

QUESTION	ANSWER	EXTRA INFORMATION	MARKS
a)	any two from <ul style="list-style-type: none"> ✗ reference to role of thermoregulatory centre detecting rise in temperature (of blood or skin) or / causing increase in sweating ✗ more evaporation ✗ more cooling / heat loss 	need to refer to more at least once to gain both marks without reference to more only award max 1 mark if both ideas given, eg cooling alone gets no marks	2
b)i)	blood vessels supplying (skin) capillaries or arteries or arterioles dilate / widen	do not accept capillaries / veins allow vasodilation do not accept idea of blood vessels moving note: marks are awarded independently accept shunt vessels close for 2 marks	1 1 1
c)i	muscle contraction	ignore relaxing do not allow vasoconstriction	1
c)ii)	respiration (respiration) releases / produces heat	reference to respiration is required for this mark	1 1
Total marks			8

QUESTION 6

QUESTION	ANSWER	EXTRA INFORMATION	MARKS
a)i)	1400	award 2 marks for correct answer if no working shown $2400 - (300 + 600 + 100)$ or equivalent for 1 mark	2
a)ii)	1/3		1
b)	A: chemical reactions	all three required for 1 mark	1

	B: food C: drinking		
c)	cools / reduces temperature	allow 'maintaining body temperature' owtte do not allow regulate unqualified ignore reference to urea numerical references to temperature should be correct	1
d)	more sweat produced less urine produced		1 1
Total marks			7