

Biology GCSE Revision

Topic 5

Homeostasis & Response

- Hormonal Coordination
- Human Nervous System

Mark Scheme

BLY2H

Question 3

question	answers	extra information	mark
3(a)	B		1
	less / no insulin (produced) or insulin produced in pancreas	allow pancreas can't monitor (blood) sugar (level) ignore pancreas can't control (blood) sugar (level) allow increased glucagon production allow A as liver stores less glucose / sugar for 2 marks only	1
3(b)(i)	(it / protein / insulin) digested / broken down	if ref to specific enzyme must be correct (protease / pepsin) ignore denatured do not accept digested in mouth / other incorrect organs	1
3(b)(ii)	any two from: <ul style="list-style-type: none">(attention to) dietexercise(pancreas) transplant / stem cells / genetic engineering	ignore injections accept examples, eg eat less sugar(y food) or eat small regular meals allow eat less carbohydrate / control diet ignore cholesterol or balanced / healthy diet ignore keep fit / healthy	2
Total			5

Question 7

question	answers	extra information	mark
7(a)	(concentration high) in the hepatic portal vein is blood with glucose absorbed from the intestine		1
	concentration is lower in the hepatic vein because insulin		1
	(has caused) glucose to be converted into glycogen or allows glucose into liver cells		1
7(b)(i)	(after 6 hours) most of the glucose has been <u>absorbed</u> from the intestine <u>or</u> from food into the blood		1
7(b)(ii)		if biological terms incorrectly spelt they must be phonetically accurate	
	because glucagon (made in the pancreas) causes	do not accept glucagon <u>made</u> / <u>produced</u> by the liver	1
	glycogen to be converted into glucose		1
	glucose released into blood	allow the liver maintains the correct / constant level of glucose in the blood	1
Total			7

Question	Answers	Extra information	Mark	AO / Spec. Ref.
8(a)	immune system	allow white blood cells / lymphocytes	1	AO1 3.3.1g/h
	produces antibodies	ignore phagocytes	1	
	(which) attack the antigens on the transplanted organ / pancreas	allow transplanted organs have foreign antigens at start of explanation and linked to attacking the organ	1	
8(b)(i)	change / rise detected by the sensor	max 2 if no ref. to artificial pancreas	1	AO1/2 3.3.3/a
	information used to calculate how much insulin she is going to need (bring her blood glucose back to normal)		1	
	(pump delivers) insulin into the blood		1	
	(causing) glucose to move into cells	allow (liver) converts glucose to glycogen	1	
8(b)(ii)	<p>any one from:</p> <ul style="list-style-type: none"> it is more accurate or less chance of human error (glucose) level will remain more stable or no big rises and falls in blood sugar levels you don't forget to test and / or inject insulin if ill or in coma insulin is still injected 	ignore continuous and automatic unqualified	1	AO3 3.3.3
Total			8	

Question	Answers	Extra information	Mark	AO / Spec. Ref.
5(a)(i)	has the least amount of glucose	allow least amount of fat or no fat	1	AO2 311d/e
	(to) transfer energy (for the run)	allow (to) release energy (for the run) do not allow produces energy do not allow ' <u>energy for respiration</u> '	1	
5(a)(ii)	any one from: <ul style="list-style-type: none"> cells will work inefficiently absorb too much water / swell / overhydrate lose too much water / shrink / dehydrate 	ignore turgid / flaccid cells burst is insufficient allow cramp <u>in muscle</u>	1	AO2 311c/f
5(b)	any three from: <ul style="list-style-type: none"> thermoregulatory centre (has temperature) receptors (which) monitor blood temperature (as it flows through the brain) (temperature) receptors in the skin (receptors) send impulses to the brain 	ignore vasoconstriction / vasodilation / sweating allow hypothalamus impulses sent to the thermoregulatory centre = 2 marks	3	AO1 332b/c

Question	Answers	Extra information	Mark	AO / Spec. Ref.
5(c)(i)	(sports drinks) contain a lot of glucose		1	AO1 / AO2 333c
	(a person with diabetes) does not produce insulin or does not produce enough insulin	allow (person with diabetes) has cells which do not respond to insulin do not allow insulin produced by liver	1	
	so <u>blood</u> glucose / sugar levels will rise too high or to a dangerous level		1	
5(c)(ii)	inject insulin or have an insulin pump (fitted)	do not allow swallow insulin accept exercise accept inhale insulin accept take metformin or other correctly named drug allow pancreatic transplant	1	AO1 333d
Total			10	

Question	Answers	Extra information	Mark	AO / Spec.
3			6	AO1 3.3.1a/c 3.1.2b
Marks awarded for this answer will be determined by the Quality of Written Communication (QWC) as well as the standard of the scientific response. Examiners should also refer to the information on page 5 and apply a 'best-fit' approach to the marking.				
0 marks	Level 1 (1–2 marks)	Level 2 (3–4 marks)	Level 3 (5–6 marks)	
No relevant content	The name (N) of a waste product is given or a process (P) that makes a waste product or an organ (O) involved	The name of a waste product is given which is linked to either the process that it is made in or the organ involved	The names of waste products are given of which at least one is correctly linked to the process it is made in and the organ(s) involved	
examples of the points made in the response		extra information ignore faeces 'Give credit for any extra correct knowledge – eg toxins are broken down in the liver and the products removed in kidneys/urine.' <ul style="list-style-type: none">• (N) ions• (P) from eating and drinking• (O) skin (through sweating)• (O) by kidneys• (O) bladder removes <u>urine</u> (from the body)		
<ul style="list-style-type: none">• (N) urea• (P) from the breakdown of amino acids• (O) (amino acids broken down) in the liver• (O) removed by kidneys• (O) bladder removes <u>urine</u> (from the body)• (N) CO₂• (P) from respiration• (O) in a named organ or in cells• (O) breathed out from lungs• (N) water• (P) from respiration• (O) in a named organ or in cells• (O) breathed out from lungs• (O) through skin (by sweating)• (O) by kidneys• (O) bladder removes <u>urine</u> (from the body)				
Total				6

Question	Answers	Extra information	Mark	AO / Spec. Ref.
7(a)	(the kidney) filters the blood	ignore refs to hormones and drugs	1	AO1 331a/c
	(and then) reabsorbs <u>all</u> of the glucose		1	
	reabsorbs some of the ions	allow salts ignore minerals	1	
	reabsorbs some of the water		1	
	releases urea (in urine)		1	
7(b)(i)	should fall from 28 (to the end of dialysis)	ignore any line drawn after end of dialysis allow + / - 0.5 square graph line must fall to / below below 15	1	AO2 331d/e
7(b)(ii)	should stay level at about 6 throughout	ignore slight variations allow + / - 1 square ignore any line drawn after end of dialysis	1	AO2 331d/f
7(c)(i)	immune system	allow white blood cells / lymphocytes	1	AO1 331g/h
	(produces) antibodies		1	
	(which) attack the antigens (on the transplanted kidney)	non-matching antigens insufficient	1	
7(c)(ii)	any one from: <ul style="list-style-type: none"> tissue typing (to find match) treating with drugs that suppress the immune system 	accept treat with immunosuppressants	1	AO1 331i
Total			11	

Question	Answers	Extra information	Mark	AO / Spec. Ref.	
3(a)(i)		award 1 mark for each liquid award 1 mark for each organ correctly linked to the liquid allow bladder instead of kidney ignore water as a liquid	4	AO1 1.2.2a	
	Liquid				Organ
	urine				kidney
	sweat				skin
3(a)(ii)	in food / diet / eating	allow in drinks / water	1	AO1 1.1.1a	

Question	Answers	Extra information	Mark	AO / Spec. Ref.
3(b)			6	AO1 1.2.1a/b/c/d /e
Marks awarded for this answer will be determined by the Quality of Written Communication (QWC) as well as the standard of the scientific response. Examiners should also refer to the information on page 5 and apply a 'best-fit' approach to the marking.				
0 marks	Level 1 (1–2 marks)	Level 2 (3–4 marks)	Level 3 (5–6 marks)	
No relevant content	identifies one type of receptor or the stimulus it detects or refers to at least one type of neurone or refers to passage of information or at least one response by an effector	identifies at least one link between: one type of receptor and the stimulus it detects and / or refers to at least one type of neurone and / or refers to passage of information and / or at least one response by an effector	identifies one type of receptor and the stimulus it detects and refers to different types of neurone and refers to passage of information or at least one response by an effector	
examples of biology points made in the response: <ul style="list-style-type: none"> • (R & S) (receptors in) skin detects pressure / pain / change in temperature • (R & S) (receptors in) eyes detect light • (R & S) (receptors in) ears detect sound • (R& S) (receptors in) ears detect changes in position • (R& S) (receptors on) tongue detects chemicals / taste • (R & S) (receptors in) nose detects chemicals / smell • (N) sensory / relay / motor neurone • (P) neurones carry impulses / electrical information • (P) ref to synapse • (P) (release of) chemical information at / across synapse • (E) muscle contracts • (E) gland releases hormone / chemical / enzyme 		extra information: (R & S) = receptor and stimulus (P) = passage of information (N) = type of neurone (E) = response by effector allow electrical signals ignore messages allow neurotransmitter or named neurotransmitter		
Total			11	

COMPONENT NUMBER: BL1HP
Question 4

question	answers	extra information	mark
4(a)(i)	any one from: <ul style="list-style-type: none"> chemical messenger / message chemical / substance produced by a gland chemical / substance transported to / acting on a <u>target</u> organ chemical / substance that <u>controls</u> <u>body</u> <u>functions</u> 	allow substance / material which is a messenger allow material produced by a gland	1
4(a)(ii)	gland / named endocrine gland	brain alone is insufficient allow phonetic spelling	1
4(a)(iii)	in blood / plasma or circulatory system or bloodstream	accept blood vessels / named do not accept blood cells / named	1
4(b)	<p>FSH stimulates oestrogen (production) / egg maturation / egg ripening</p> <p>oestrogen inhibits FSH</p> <p>LH stimulates egg / ovum release / ovulation</p>	<p>each hormone must be linked to correct action</p> <p>apply list principle</p> <p>ignore the gland producing hormone</p> <p>ignore production / development of egg</p> <p>allow oestrogen stimulates LH / build up of uterine <u>lining</u></p> <p>accept LH inhibits oestrogen accept LH controls / stimulates growth of corpus luteum ignore production of egg</p>	<p>1</p> <p>1</p> <p>1</p>
Total			6

BL1HP

Question 2

question	answers	extra information	mark
2(a)(i)	A – pituitary	allow hypothalamus	1
	B – ovary / ovaries		1
2(a)(ii)	in blood (stream)	accept in plasma ignore dissolved	1
2(b)(i)	FSH and Luteinising Hormone (LH)		1
2(b)(ii)	fertilised OR reference to sperm		1
	form embryos / ball of cells or cell division		1
	(embryo) inserted into mother's womb / uterus	allow (fertilised egg) is inserted into mother's womb / uterus	1
2(b)(iii)	any one from: <ul style="list-style-type: none"> multiple births lead to low birth weight multiple births cause possible harm to mother / fetus / embryo / baby / miscarriages 	allow premature ignore reference to cost / ethics / population	1
2(c)(i)	any one from: <ul style="list-style-type: none"> almost identical both approximately 20% 	allow S (slightly) more successful	1
2(c)(ii)	larger numbers (in clinic R) (in 2007)	allow <u>only</u> 98 (in S) (compared to 1004 (in R))	1
	results likely to be more repeatable (in 2008)	allow more reliable do not accept more reproducible / accurate / precise	1
Total			11

Question	Answers	Extra information	Mark	AO / Spec ref.
8(a)	(shoots) grow against (the force / direction of) gravity (gravity is down and) shoots are growing upwards cannot conclude anything about light / phototropism as growth is in the dark	ignore ref to roots / moisture allow negative geotropism / gravitropism	1 1 1	AO2/AO3 1.2.3a
8(b)	(after 5 days / Figure 7) when gravity and moisture are in the same direction / down the roots grow towards both / down (after 2 more days / Figure 8) when moisture and gravity are in opposite directions, the roots grow towards water	ignore shoots no mark for moisture unqualified max 1 mark if moisture not stated as more important or if gravity given as more important allow (after 5 days / Figure 7) roots grow towards moisture and gravity allow (after 2 more days / Figure 8) roots grow towards moisture and away from gravity	1 1	AO3 1.2.3a
8(c)(i)	unequal distribution of hormone / auxin (so there is) unequal growth rates	allow more hormone / auxin on darker side or converse allow more / faster growth on darker side or converse	1 1	AO1 1.2.3b/c
8(c)(ii)	more surface area exposed to light or more light absorbed (by leaves / plant) more photosynthesis	allow more glucose / carbohydrate / biomass produced for 2 marks there must be a reference to 'more' at least once	1 1	AO2 1.5.1a
Total			9	

Question	Answers	Extra information	Mark	AO / Spec. Ref.
3(a)(i)	<p>any one from:</p> <ul style="list-style-type: none"> • (same) (type of) weed killer • (same) volume / 5dm^3 of solution used (on each area) • effect on daisies (not other weeds / plants) • (same) area / 10m^2 • (same) time or (effect after) two weeks 	<p>ignore references to same lawn / weather / soil, which are not given in the question.</p> <p>allow amount of solution used</p> <p>do not allow amount / volume / concentration of weed killer</p> <p>do not allow number of daisy plants</p>	1	AO2 1.2.3d
3(a)(ii)	more (daisies) growing after use of weed killer or after two weeks	allow it does not fit pattern (of other results)	1	AO3 1.2.3d
3(a)(iii)	<p>any one from:</p> <ul style="list-style-type: none"> • as a control • to compare (to the other areas) • to check other factor(s) are not affecting the results / daisies 	<p>ignore to see if it / water has an effect</p> <p>do not allow as a control variable</p>	1	AO2 1.2.3d
3(a)(iv)	80 (arbitrary units of weed killer) also killed all the daisies	<p>allow ref to possible experimental design flaws such as 'only tested once' or 'not repeated' or 'different number of daisies in each area at first'</p> <p>allow idea that other weed species may not respond in the same way as daisies</p> <p>allow idea that 100 (units) may also kill wanted species / grass</p>	1	AO3 1.2.3d

Question	Answers	Extra information	Mark	AO / Spec. Ref
3(b)			6	AO1 1.2.3a/b/c
Marks awarded for this answer will be determined by the Quality of Written Communication (QWC) as well as the standard of the scientific response. Examiners should also refer to the information on page 5 and apply a 'best-fit' approach to the marking.				
0 marks	Level 1 (1–2 marks)	Level 2 (3–4 marks)	Level 3 (5–6 marks)	
No relevant content.	Reference to at least one environmental factor plants respond to or at least one response or a named hormone	Reference to at least one environmental factor plants respond to and at least one associated response or reference to a named hormone and at least one associated response	Reference to at least one environmental factor plants respond to and at least one associated response and reference to a named hormone	
examples of biology points made in the response: <i>environmental factors</i> <ul style="list-style-type: none">• light• (direction of the force of) gravity• moisture / water <i>effects on direction of growth</i> <ul style="list-style-type: none">• shoots grow upwards• shoots grow towards light• shoots grow against (the force of) gravity• roots grow downwards• roots grow towards moisture• roots grow towards (the force of) gravity <i>hormone</i> <ul style="list-style-type: none">• reference to auxin• unequal distribution of hormone causes unequal growth (rates)		extra information allow phototropism allow gravi/geotropism allow hydrotropism allow reference to 'positive' and 'negative' in terms of tropisms as indicating direction of growth allow other named hormone(s) allow higher concentration of hormone causes faster growth in shoots allow higher concentration of hormone causes slower growth in roots		
Total			10	

BL1HP

Question 4

question	answers	extra information	mark
4 (a)	any two control variables for 1 mark each: <ul style="list-style-type: none"> • age / size of shoots • species or type of plant / seeds • light intensity • (other) named condition eg temperature / water 	accept amount of light / colour of light	2
4 (b)	ref to auxin / hormone unequal (lateral) distribution more hormone on dark side causes growth on dark side	ignore reference to phototropism	1 1 1 1
4 (c)(i)	(detection) in tip / top / end		1
4 (c)(ii)	(response) behind tip	allow at tip / end / top half	1
Total			8

Human Nervous System

Question	Answers		Extra information	Mark	AO / Spec. Ref.				
7(a)	detect changes in surroundings or detect stimuli convert information to impulse		allow any named stimulus for skin allow send impulse to sensory neurones / brain	1 1	AO1 1.2.1a/b				
7(b)(i)	<table><tr><td>muscle</td><td>contract(ion)</td></tr><tr><td>gland</td><td>release / secrete / produce chemical / hormone / enzyme</td></tr></table>		muscle	contract(ion)	gland	release / secrete / produce chemical / hormone / enzyme	1 mark for each effector 1 mark for each response response must match type of effector (if given) ignore examples ignore relax(ation) / movement for contraction do not allow expansion for muscles	4	AO1 1.2.1e
muscle	contract(ion)								
gland	release / secrete / produce chemical / hormone / enzyme								
7(b)(ii)	any one from: <ul style="list-style-type: none">• (maintain temperature at which) enzymes work best• so chemical reactions are fast(est)• prevent damage to cells / enzymes		allow prevent enzymes being denatured (by temperature being too high)	1	AO1 1.2.2a				
Total				7					

COMPONENT NUMBER: BL1HP**Question 7**

question	answers	extra information	mark
7(a)	A sensory	ignore nerve / neuron(e) throughout accept <u>a</u> fferent	1
	B motor	accept <u>e</u> fferent	1
	C relay	accept intermediate	1
7(b)	stretch	allow pressure / pull / tension (in muscle) allow a hit at (point) P ignore pain	1
7(c)	any three from: <ul style="list-style-type: none"> chemical (release) diffuses (across the gap / synapse) transmits impulse / information (across synapse) between neurones / nerve cells / named 	accept neurotransmitter / acetylcholine allow transmits signal / message if named, must be either sensory / A to relay / C or relay / C to motor / B allow 'to the next neurone'	3
Total			7

Question	Answers	Extra information	Mark	AO / Spec. Ref.
4(a)	receptors detect / sense stimuli / change in surroundings or convert stimulus into an impulse	ignore send impulses to brain / spinal cord	1	AO1 1.2.1b/d/e
	example of a receptor	allow any appropriate organ or part of an organ, eg eye / retina or named type of receptor eg light receptor	1	
	effectors allow / make response or convert an impulse to an action	ignore receive impulses from brain / spinal cord	1	
	(effector) muscle / gland	allow an example ignore eg arm / leg	1	
4(b)(i)	junction	allow idea of a (small) gap / space	1	AO1 1.2.1e
	between neuron(e)s	do not allow if implication is that the neurones move allow named types of neurones	1	
4(b)(ii)	chemical	allow answers in terms of specific types of neurone	1	AO1 1.2.1e
	any one from: <ul style="list-style-type: none"> (chemical released) from one neurone (chemical) passes (across synapse) to next neurone to stimulate / cause (electrical) impulse 	allow neurotransmitter / named neurotransmitter released ignore produced allow diffuses for passes (across)	1	

Question	Answers	Extra information	Mark	AO / Spec. Ref.
4(c)(i)	skin	ignore hand / leg	1	AO2 1.2.1b
4(c)(ii)	1.6 (cm per millisecond)	allow 2 if evidence of rounding up of 1.6	1	AO2 1.2.1d/e
4(c)(iii)	any two from: <ul style="list-style-type: none"> • synapses slow down transmission / impulse • fewer synapses (via brain) • (therefore) fewer delays 	ignore length of neurones allow idea of movement of chemical being slower than electrical impulse allow one synapse compared to two or only one synapse allow impulse travels more slowly in relay neurones	2	AO3 1.2.1d/e
Total			12	

Question	Answers	Extra information	Mark	AO / Spec. Ref.
3(b)			6	AO1 1.2.1a/b/c/d /e
Marks awarded for this answer will be determined by the Quality of Written Communication (QWC) as well as the standard of the scientific response. Examiners should also refer to the information on page 5 and apply a 'best-fit' approach to the marking.				
0 marks	Level 1 (1–2 marks)	Level 2 (3–4 marks)	Level 3 (5–6 marks)	
No relevant content	identifies one type of receptor or the stimulus it detects or refers to at least one type of neurone or refers to passage of information or at least one response by an effector	identifies at least one link between: one type of receptor and the stimulus it detects and / or refers to at least one type of neurone and / or refers to passage of information and / or at least one response by an effector	identifies one type of receptor and the stimulus it detects and refers to different types of neurone and refers to passage of information or at least one response by an effector	
examples of biology points made in the response: <ul style="list-style-type: none"> • (R & S) (receptors in) skin detects pressure / pain / change in temperature • (R & S) (receptors in) eyes detect light • (R & S) (receptors in) ears detect sound • (R & S) (receptors in) ears detect changes in position • (R & S) (receptors on) tongue detects chemicals / taste • (R & S) (receptors in) nose detects chemicals / smell • (N) sensory / relay / motor neurone • (P) neurones carry impulses / electrical information • (P) ref to synapse • (P) (release of) chemical information at / across synapse • (E) muscle contracts • (E) gland releases hormone / chemical / enzyme 		extra information: (R & S) = receptor and stimulus (P) = passage of information (N) = type of neurone (E) = response by effector allow electrical signals ignore messages allow neurotransmitter or named neurotransmitter		
Total				11

Question	Answers	Extra information	Mark	AO / spec ref.
5(a)	motor	allow efferent / postsynaptic allow another relay (neurone)	1	AO1 1.2.1d, e
5(b)	release of chemical (from relay neurone)	allow ecf for 'motor' neurone from (a) allow release of neurotransmitter / named example	1	AO1 / AO2 1.2.1e
	chemical crosses gap / junction / synapse	allow diffuses across allow chemical moves to X	1	
	chemical attaches to X / motor / next neurone (causing impulse)		1	
5(c)	(curare) decrease / no contraction	accept (muscle) relaxes	1	AO2 / AO3 1.2.1e
	(strychnine) increase / more contraction	if no other mark awarded allow 1 mark for (curare) decrease / no response and (strychnine) increase / more response	1	
Total			6	

Question 7

question	answers	extra information	mark
7(a)	A cytoplasm	in this order only	1
	B (cell) membrane	do not accept (cell) wall	1
7(b)(i)	synapse		1
7(b)(ii)	(as) chemical	accept neurotransmitter or named ignore references to how the chemical is passed do not accept electrical	1
7(c)	(from light-sensitive cell to connecting neurone) to sensory neurone	ignore references to synapses accept 'nerve cell' for neuron(e) throughout penalise 'nerve' for neurone once only	1
	(sensory neurone) to brain / CNS	allow (sensory neurone) to relay neurone / spinal cord	1
	(brain / CNS) to motor neurone	allow (relay neurone / spinal cord) to motor neurone	1
	(motor neurone) to (eyelid) muscle	ignore effector	1
Total			8

BLY2H

Question 1

question	answers	extra information	mark
1(a)(i)	the lower the temperature the shorter the time or the lower the temperature the more chance of frostbite	a trend is required accept reverse accept the lower the temperature the faster you get frostbite accept positive correlation but not directly proportional ignore wind speed	1
1(a)(ii)	any value from 5 to below 10	do not accept 10 allow less than 10 or < 10	1
1(b)	Muscles 'shiver' Blood vessels supplying the skin capillaries constrict	if more than two boxes ticked deduct 1 mark for each additional tick	1 1
Total			4

Question	Answers	Extra information	Mark	AO / spec ref.
6(a)(i)	1 hour 15 mins / 1.25 hours / 75 mins	allow 1:15 ignore 1.15 hours	1	AO3 3.3.2
6(a)(ii)	<p>increase in (core / body) temperature</p> <p>(due to an) increase in <u>respiration</u> or more <u>muscle</u> contraction</p> <p>releasing energy (as a waste product)</p> <p>skin temperature decreases</p> <p>(because there is) sweating</p> <p>(which) evaporates and cools the skin</p>	<p>ignore numbers</p> <p>allow produces 'heat' do not allow making energy</p> <p>ignore references to vasodilation or vasoconstriction</p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p>	AO1 / AO2 / AO3 3.3.2a
6(a)(iii)	<p>(there is) dilation of vessels (supplying skin capillaries)</p> <p>(so) more blood flows (near skin) (surface) or blood is closer (to the skin)</p>	<p>allow vasodilation allow blood vessels widen ignore expand do not accept dilating capillaries or moving vessels</p> <p>ignore ref to heat</p>	<p>1</p> <p>1</p>	AO1 / AO2 3.3.2d
6(b)	<p>pancreas detects (low) blood glucose</p> <p>produces glucagon</p> <p>(so) glycogen is converted to glucose</p>	<p>do not allow glucagon made in the liver</p> <p>allow adrenaline released which increases conversion of glycogen to glucose or reduced insulin production so less glucose into cells / less glucose converted to glycogen for 1 mark</p>	<p>1</p> <p>1</p> <p>1</p>	AO1 3.3.3b
Total			12	

Question	Answers	Extra information	Mark	AO / Spec. Ref.
7(a)	(detected by) <u>thermoregulatory</u> centre	allow thermoregulatory part of brain allow detected by receptors in the brain	1	AO1 3.3.2b
7(b)	muscles <u>contract</u> (rapidly) this requires <u>respiration</u> (which) releases energy	 do not allow making energy allow making / releasing 'heat' ignore warms you up	1 1 1	AO1 3.3.2e
7(c)	blood vessels supplying the skin constrict (so) less blood flows to the skin / surface (of skin) (and) less energy is transferred (to the environment)	'skin' must be mentioned once for full marks allow vasoconstriction do not allow capillaries / veins constrict do not allow capillaries moving allow less heat is lost (to the environment) if no other marks awarded allow reduce sweating for 1 mark	1 1 1	AO1 3.3.2e
Total			7	

Question	Answers	Extra information	Mark	AO / Spec. Ref.
7	blood vessels supplying skin	ignore hair erection	1	AO1 3.3.2e
	constrict	allow vasoconstriction do not allow capillaries /veins constricting do not allow moving blood vessel	1	
	less blood flow (to / through capillaries / to skin)	allow blood flows further away from skin surface	1	
	so less energy is lost (to the surroundings)	allow less heat is lost	1	
	'shivering' by <u>muscle</u> (contraction)	allow <u>muscles</u> contract (and relax) rapidly	1	
	releasing energy or respiring (more)	allow 'heat produced' do not allow energy produced / made do not allow energy for respiration allow sweating stops / reduces	1	
Total			6	