

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

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)	increase in (core / body) temperature (due to an) increase in <u>respiration</u> or more <u>muscle</u> 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	AO1 / AO2 / AO3 3.3.2a
6(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	AO1 / AO2 3.3.2d
6(b)	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 to glucose or reduced insulin production so less glucose into cells / less glucose converted to glycogen for 1 mark	1 1 1	AO1 3.3.3b
Total			12	

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.
3			6	AO1
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.				3.3.1a/c 3.1.2b
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		
<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) <ul style="list-style-type: none">• (N) CO₂• (P) from respiration• (O) in a named organ or in cells• (O) breathed out from lungs <ul style="list-style-type: none">• (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)		<p>ignore faeces</p> <p>'Give credit for any extra correct knowledge – eg toxins are broken down in the liver and the products removed in kidneys/urine.'</p> <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)		
Total				6

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 10

Question	Answers	Extra information	Mark	AO / Spec. Ref.
10.1	too much thyroxine is released into the blood		1	AO1/1 4.5.3.7
	which raises BMR		1	AO1/1 4.5.3.7
	causing increase in formation of glycogen / lipids / proteins or increase in rate of respiration or increase in breakdown of excess proteins		1	AO1/1 4.5.3.7
10.2	FSH causes eggs to mature and stimulate ovaries to produce oestrogen		1	AO1/1 4.5.3.4
	LH stimulates the egg to be released		1	AO1/1 4.5.3.4
10.3	(missing a dose causes a) dip / drop in progesterone levels		1	AO2/1 4.5.3.4
	(therefore) FSH is not inhibited anymore		1	AO2/1 4.5.3.4
	(therefore) LH is not inhibited anymore		1	AO2/1 4.5.3.4
	(and consequently) an egg is matured and released	allow (and consequently) an egg is available to be fertilised	1	AO3/1b 4.5.3.4
Total			9	

Question	Answers	Extra information	Mark	AO / Spec. Ref.
8(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	
	(but) releases urea (in urine)		1	
8(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 15	1	AO2 331d/e
8(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
8(c)	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	
Total			10	

Question	Answers	Extra information	Mark	AO / Spec Ref
9(a)	<p>(concentration high) in the hepatic portal vein is blood with glucose absorbed from the intestine</p> <p>concentration is lower in the hepatic vein because insulin</p> <p>(has caused) glucose to be converted into glycogen</p> <p>or</p> <p>allows glucose into liver cells</p>		<p>1</p> <p>1</p> <p>1</p>	<p>AO1</p> <p>AO2</p> <p>AO3</p> <p>3.3.3</p>
9(b)(i)	<p>(after 6 hours) most of the glucose has been absorbed from the intestine or from food into the blood</p>		1	<p>AO2</p> <p>3.3.3</p>
9(b)(ii)	<p>because glucagon (made in the pancreas) causes</p> <p>glycogen to be converted into glucose</p> <p>glucose released into blood</p>	<p>if biological terms incorrectly spelt they must be phonetically accurate</p> <p>do not allow glucagon made / produced by the liver</p> <p>allow the liver maintains the correct / constant level of glucose in the blood</p>	<p>1</p> <p>1</p> <p>1</p>	<p>AO1</p> <p>AO2</p> <p>AO3</p> <p>3.3.3</p>
Total			7	

Question number	Answer	Mark
9(a)	C	(1)

Question number	Answer	Mark
9(b)(i)	<p>An explanation that combines identification – understanding (1 mark) and reasoning/justification – understanding (2 marks):</p> <ul style="list-style-type: none"> ultrafiltration occurs in the glomerulus where the liquid part of the blood passes into the Bowman’s capsule (1) reabsorption takes place as it travels through the proximal convoluted tubule into the loop of Henle (1) finally urine production occurs in the collecting duct and excess fluid and sodium ions are removed (1) 	(3)

Question number	Answer	Mark
9(b)(ii)	<p>An explanation that combines identification – application of knowledge (1 mark) and reasoning/justification – application of understanding (1 mark):</p> <ul style="list-style-type: none"> the kangaroo rat lives in the desert so it needs to retain as much water as possible (1) as most water is reabsorbed in the loop of Henle, a longer loop gives more surface area for water reabsorption (1) 	(2)

Question Number	Indicative content	Mark
*9(b)(iii)	<p>Answers will be credited according to candidate's deployment of knowledge and understanding of the material in relation to the qualities and skills outlined in the generic mark scheme.</p> <p>The indicative content below is not prescriptive and candidates are not required to include all the material that is indicated as relevant. Additional content included in the response must be scientific and relevant.</p> <p style="text-align: center;">AO2 (6 marks)</p> <p>water content</p> <ul style="list-style-type: none"> increased ADH causes more water to be reabsorbed into the bloodstream prevents dehydration decreased concentrations of ADH cause less water reabsorption greater volume of urine produced at 0.0 mol/dm^{-3} of sodium ions the volume of ADH stored is at its highest so the lowest amount of ADH is released water levels in the body are regulated <p>sodium ions</p> <ul style="list-style-type: none"> as sodium ion concentration increases the levels of ADH stored decrease at 0.25 mol/dm^{-3} ADH stored reduced by 5 au so a small amount of water is reabsorbed at 0.50 mol/dm^{-3} ADH stored reduced by a further 30 au a greater amount of water is reabsorbed the volume of ADH stored remains stable at 8 au causing the maximum amount of water to be reabsorbed preventing dehydration when sodium levels are high 	(6)

Level	Mark	Descriptor
	0	No awardable content
Level 1	1–2	<ul style="list-style-type: none"> The explanation attempts to link and apply knowledge and understanding of scientific ideas, flawed or simplistic connections made between elements in the context of the question. Lines of reasoning are unsupported or unclear. (AO2)
Level 2	3–4	<ul style="list-style-type: none"> The explanation is mostly supported through linkage and application of knowledge and understanding of scientific ideas, some logical connections made between elements in the context of the question. Lines of reasoning mostly supported through the application of relevant evidence. (AO2)
Level 3	5–6	<ul style="list-style-type: none"> The explanation is supported throughout by linkage and application of knowledge and understanding of scientific ideas, logical connections made between elements in the

		<p>context of the question.</p> <ul style="list-style-type: none">• Lines of reasoning are supported by sustained application of relevant evidence. (AO2)
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