UHCA &Cbso_q' @gmjmew EAQC

Rmnga 2,1 Fmkcmqr_qgqgl

Fsk_lq

Oscqrgmlq `w Rmnga + K_pi

Qafckc

1.

Question	Marking details	Marks Available
(a)	Hormone = insulin in both boxes ;	2
	Organ = pancreas;	1
	Increase = glucose;	1
	Decrease = glucose;	1

2.

Sub-section			Mark	Answer	Accept	Neutral answer	Do not accept
(a)	i		2	increased Glucose available; for respiration/ energy release; correct context			
	ii		2	Decreases; As Glycogen changed to glucose;			
(b)			1	Negative feedback/ homeostasis;			
Total Mark			5				

3.

Sub-section			Mark	Answer	Accept	Neutral answer	Do not accept
(a)			1	<u>hormone</u>;			
(b)			3	pancreas; (phonetic spelling) glucose; (correct spelling) glycogen; (correct spelling)			pancrease
(c)			2	(type 1 or type 2) diabetes; **one** from: <u>low</u> {sugar/ carbohydrate} {diet/foods}/ {injections/shots} of insulin/ insulin pen/ insulin pump/ pancreas transplant/ <u>named</u> tablets (e.g. novonorm/metformin);			Take insulin/ take tablets
Total Mark			6				

4.

Marking details	Marks Available
Indicative content: Pancreas Secretes insulin Travels in blood stream To liver Glucose is converted to glycogen Glycogen stored in the liver **5 – 6 marks** The candidate constructs an articulate, integrated account correctly linking relevant points, such as those in the indicative content, which shows sequential reasoning. The answer fully addresses the question with no irrelevant inclusions or significant omissions. The candidate uses appropriate scientific terminology and accurate spelling, punctuation and grammar. **3 – 4 marks** The candidate constructs an account correctly linking some relevant points, such as those in the indicative content, showing some reasoning. The answer addresses the question with some omissions. The candidate uses mainly appropriate scientific terminology and some accurate spelling, punctuation and grammar. **1 – 2 marks** The candidate makes some relevant points, such as those in the indicative content, showing limited reasoning. The answer addresses the question with significant omissions. The candidate uses limited scientific terminology and inaccuracies in spelling, punctuation and grammar. **0 marks** The candidate does not make any attempt or give a relevant answer worthy of credit.	6
Question 4 total	**[6]**

5.

Question		Marking details	Marks Available
(a)	(i)	Midday meal; smallest/ lowest {dose/ amount} of insulin (injected); NOT lowest level of glucose/ sugar/ carbohydrate in the meal	2
	(ii)	She underestimated the amount of glucose/sugar/carbohydrate in the meal/more glucose than she {thought/estimated/ calculated} there would be; {Injected/dose/gave}too little insulin;	2
(b)		{Converts/ changes} glucose to glycogen (correct spelling); Stored/in the liver; NOT insulin stores glucose as glycogen 2nd mark only credited if reference to glycogen	2
		Question 5 total	**[6]**

6.

Question		Marking details	Marks Available
(a)		Negative feedback; NOT homeostasis	1
(b)	(i)	Insulin;	1
	(ii)	Glucagon; correct spelling	1
(c)		Liver;	1

7.

Sub-section	Mark	Answer	Accept	Neutral answer	Do not accept
(a)	3	• (it rises because) glucose is {absorbed into/enters} the blood (stream); • pancreas {secretes/ releases/ produces/ makes} insulin; • which converts (excess) glucose to glycogen (in liver) (so blood glucose falls); Correct spelling for glycogen			
(b)	2	any two from: • {glucose/ sugar} level is above {5.9 mmol/l/ normal}{before her meal/ at the start}/ {glucose/ sugar} level was higher than normal before she ate; • rises to a {very/abnormally/ unusually} high level; • hasn't fallen back to her starting level (after 120 minutes)/ takes longer to return to her starting level; • Her (blood) glucose level is always above normal;			
Total Mark	5				

8.

Mark	Answer	Accept	Neutral answer	Do not accept
3	produces/releases/gives out <u>insulin</u>; which turns {glucose/ sugar} to <u>glycogen</u>; Not broken down (glycogen is stored) in the <u>liver;</u>			
3				

9.

Sub-section			Mark	Answer	Accept	Neutral answer	Do not accept
(a)			1	Pancreas;			pancrease
(b)			1	Changes glycogen into glucose; Correct spelling for glycogen			
(c)			2	Deliver more insulin; Deliver less glucagon; Correct spelling for glucagon			
(d)	(i)		1	Reduction in {carbohydrate/ sugar/ starch} / cut out excess {carbohydrate/ sugar/ starch};		fat	
	(ii)		2	Any **2** from: • Type 2 is more common in old(er) people/diabetes was newly diagnosed/ late onset diabetes; • Type 1 is usually is present at birth		Obesity/ genetics	
Total Mark			7				

10.

Sub-section			Mark	Answer	Accept	Neutral answer	Do not accept
(a)			1	carbohydrate/starch/bread/potato/rice/pasta;	any other source of carbohydrate /starch		
(b)			1 1	pancreas {secretes/ produces/ makes/ releases} insulin; which converts glucose into glycogen;			
(c)			1	blood glucose {rises/ increases} to high level/ slow fall in blood glucose levels/ blood glucose levels do not fall to {between 3.5 – 7.5 mmol/l/ normal};			
(d)			2	*1 mark for **first two columns** circled correctly*			

11.

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
11	(a)	(i)		To prevent (the development of) diabetes/ (early diagnosis is vital) so it can be treated {as soon as possible/ earlier} **not** cure		1		1		
		(ii)		no – {ethnic / age/ genetics} are risk factors/ can run in families			1	1		
	(b)			{control/reduce} diet high in {carbohydrate/ sugary/ fat} food/ regular exercise (1) (in order to) prevent {obesity/ being overweight}/ to lose weight (1)	2			2		
	(c)			(excess) glucose/ blood sugar will not be {converted /stored} (1) as glycogen/ in the liver (1) so (blood) glucose level will remain high (1)	3			3		
				Question 11 total	**5**	**1**	**1**	**7**	**0**	**0**

12.

Question		Marking details	Marks Available
(a)		(3) 2 5 1 (6) 4;;; All 4 correct = 3marks 2/3 correct = 2 marks 1 correct = 1 mark	[3]
(b)		glucose; NOT sugar	[1]
(c)	(i)	0.8;	[1]
	(ii)	Reference {eating/ take in / ingest/ consume} too much fat/ too much fat in diet; Reference {eating/ take in / ingest/ consume} too much sugar/ carbohydrates; NOT carbs (Alternative if first two not awarded) eat too much/ too many calories/ energy; NOT too much chocolate Sedentary/ lack of exercise/ not enough sport;	[3]

13.

Sub-section			Mark	Answer	Accept	Neutral answer	Do not accept
(a)							
	iii		1	in the blood(stream);	blood vessels/ veins/ arteries/ capillaries		in blood cells
(b)			1	C;	1,2 and 3		
(c)			1	glucose;	sugar		blood sugar
(d)			2	{regular / description of regular} exercise/ exercise often; eat less {carbohydrate/starch/ sugar/ fat};			more exercise/ keep fit eat less food/ control the quantity of fat/ eat no fat

14.

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
14	(a)			Pancreas Reject Pancrease	1			1		
	(b)	(i)		Arrow drawn at 160 mg/100cm^3 (1) All plots correct = 2 marks 5 plots correct = 1 mark 0/1/2/3/4 plots correct =0 marks <1 small square tolerance Line quality(1)		4		4	4	
		(ii)		From 1 hour (1) ecf when {glucose level/ concentration/ it} starts to fall/ decreases (1) Accept glucose changed to glycogen			2	2		
		(iii)		Blood glucose rises above {the normal range/ 160}		1		1		
		(iv)		1. Kate's blood glucose {reaches higher level/rises more rapidly/goes on rising after 1 hour} (1) 2. falls more slowly (1) 3. does not go back to {the start/normal level} (1)			3	3		
		(v)		Repeat the test/ do more tests(on Kate)			1	1		1
	(c)	(i)		Any one (x1) from • Insulin injections/ insulin pump • Pancreas tissue transplants/ • {low sugar/ low carbohydrate/ low fat} diet • Metformin tablet	1			1		
		(ii)		Type 2 diabetes	1			1		
				Question 14 total	**3**	**5**	**6**	**14**	**4**	**1**

15.

Question		Marking details	Marks Available
15	(a)	Erector muscle;	1
	(b)	1. Hairs {erect/raised/ stand up/ stick up/ are lifted/ pulled up/ straight up/ up};	3
		2. Trap thicker layer of air/ more air trapped;	
		NOT trap layer of warm air (can be neutral)	
		3. Which is {an insulator/ poor conductor} / which lets less heat pass out/ which insulates/ harder for heat to escape;	
		NOT no heat passes out	
		3rd mark only awarded if 2nd awarded	
		ACCEPT REVERSE ARGUMENT	
	(c)	Any **two** from:	2
		1. Vasoconstriction/ {capillaries/ blood vessels} {narrow/ constrict/ thinner}/ diameter gets smaller;	
		NOT contract/ get smaller/ blood vessels moving up and/or down	
		2. shivering;	
		{reduced/ no} sweating/ less sweat {produced/ secreted};	
		Question 15 Total	**[6]**

16.

Question	Marking details	Marks Available
(a)	A <u>erector</u> muscle;	2
	B <u>sweat</u> pore;	
(b)	Any two of the following.	4
	1 mark for response 1 mark for explanation(2x2)	
	Response: hairs flattened; NOT hairs relax/ lie down	
	Explanation: {thin layer of / insulating layer of/ less} air trapped so more heat {can escape/ be lost}; NOT no air trapped	
	Response: sweat (present)/ sweating/ sweat produced;	
	Explanation: <u>heat</u> lost by <u>evaporation</u>/ <u>heat</u> {removed from the body/ used} to <u>evaporate</u> sweat;	
	Response: vasodilation/blood vessels <u>wider</u>; NOT larger/ increase in size/ grow/ expand/ bigger	
	Explanation: <u>more</u> blood near skin surface <u>more</u> heat lost; NOT blood gets nearer to skin surface	

17.

Sub-section			Mark	Answer	Accept	Neutral answer	Do not accept
(a)			2	A hair B sweat gland			Hair follicle Sweat duct
(b)	i		2	any **two** from • sweating/ produces sweat; • vasodilation/ blood vessels widen; • hairs lying flat/ hairs lie {flat/down}/ hairs lowered;		Erector muscle relaxes	sweat Blood vessels {open/ get bigger/ larger/thicken/ enlarge}/ expand. hairs are flat
	ii		2	Less/not as much blood flowing (through the blood vessels); therefore less/not as much heat is {lost/ radiated} 2nd mark linked to 1st mark			Any reference to blood vessels moving {up to/ down from} skin surface. No heat is lost
Total Mark			6				

18.

Sub-section			Mark	Answer	Accept	Neutral answer	Do not accept
(a)	(i)		1	erector muscle;			
	(ii)		1	Hair shaft to be shown raised; Hair should be higher than first diagram and no higher than 90° and should attach to the correct end of the muscle. Hair must protrude from the surface of the skin.			
	(iii)		1	it contracts/ contracting/ contraction;			Tenses/ pulls/ tightens/ shortens
	(iv)		2	traps layer of air; which is an insulator	Holds air/ keeps layer of air Poor conductor of heat	Keeps heat in	Traps heat
(b)			3	• more sweat produced (on a hot day); • {comes onto/spread over} the {skin/surface}/ comes through the (sweat) pore; evaporation (takes heat out);			
Total Mark			8				

19.

Sub-section			Mark	Answer	Accept	Neutral answer	Do not accept
(a)			2	A sweat gland; B blood vessel/ capillary;			 Vein/ artery
(b)	(i)		2	as the {(environmental) temperature/ it} increases body temp increases; as the {environmental temperature/ it} increases sweat production increases; (ORA) as the {environmental temperature/ it} increases both increase = 2 marks as the {environmental temperature/ it} decreases both decrease = 2 marks	reverse answer		
	(ii)		1	(-)0.8(°C);	0.75-0.85 (°C)		
(c)			3	• (sweat production increases and) sweat evaporates; • Using heat from body/skin/blood ; • (body) temperature falls/ causing cooling/ more heat lost from the body; 3rd mark linked to 1st mark			
Total Mark			8				

20.

Mark	Answer
6 QWC	**Indicative content** • under warm conditions erector muscle relaxes • hair lies flat • reducing insulation • blood vessel widens/dilates/ vasodilates • more blood flows through skin • more heat lost • more sweat produced • onto the surface of the skin/ out of the sweat pore • evaporation removing heat **TOP BAND** must have reference to all three structures. **5-6 marks** The candidate constructs an articulate, integrated account correctly linking relevant points, such as those in the indicative content, which shows sequential reasoning. The answer fully addresses the question with no irrelevant inclusions or significant omissions. The candidate uses appropriate scientific terminology and accurate spelling, punctuation and grammar. **3-4 marks** The candidate constructs an account correctly linking some relevant points, such as those in the indicative content, showing some reasoning. The answer addresses the question with some omissions. The candidate uses mainly appropriate scientific terminology and some accurate spelling, punctuation and grammar. **1-2 marks** The candidate makes some relevant points, such as those in the indicative content, showing limited reasoning. The answer addresses the question with significant omissions. The candidate uses limited scientific terminology and inaccuracies in spelling, punctuation and grammar. **0 marks** The candidate does not make any attempt or give a relevant answer worthy of credit.

21.

Question			Marking details	Marks Available					
				AO1	AO2	AO3	Total	Maths	Prac
(a)			A change from {optimal/normal} (internal conditions) (1) resulting in the body {compensating/responding} and restoring {balance/optimal conditions/normal conditions/set level} (1)	2			2		
(b)	(i)		Temperature decreased		1		1		
	(ii)		1. Receptors (on skin) detect a drop in (body) temperature (1) 2. Blood vessels get {narrower/ constrict}/ vasoconstriction (1) Reject blood vessels contract 3. less blood flows to the skin (1) 4. less heat is lost (from the surface of skin) (1)			4	4		
(c)			more blood remains in core of body/less blood in the extremities		1		1		
(d)			the {response/change in temperature} (to placing hand in cold water) would be slower/ reaction time would increase Temperature of sensor(s) would be higher		1		1		
			Question 21 total	**2**	**3**	**4**	**9**	**0**	**0**

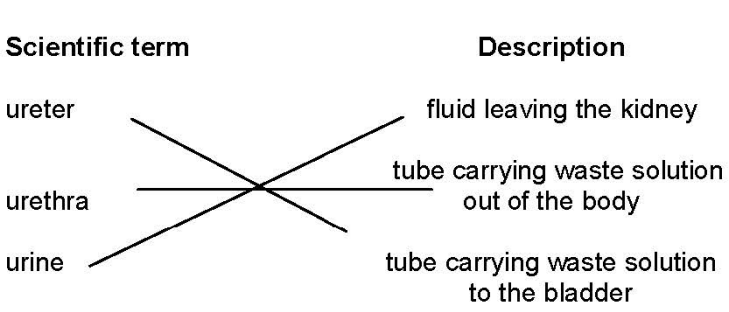
22.

Question		Marking details	Marks Available
(a)	(i)	Excretion ; NOT filtration	1
(b)	(i)	28 **and** 39;	1
	(ii)	4 bars each correct height with label – 3 marks 3bars each correct height with label – 2 marks 2 bars each correct height with label – 1 mark ½ small square tolerance in plotting height *Correct order (either way)* Kidney (family donor) Kidney (non-family donor) Lung Heart Liver Allow <u>all</u> bars correct height and **in sequence** but <u>no</u> labels = 1 mark	3
	(iii)	They have been done for different lengths of time/ some have been done for longer (time than others);	1

23.

Sub-section			Mark	Answer	Accept	Neutral answer	Do not accept
(a)			3	B and <u>urine</u> out of kidney/ to bladder ; D and urethra (1) correct spelling only Bladder and {stores/holds} urine;	Keeps urine		
(b)	i		1	Any **2** for **1** mark (excess) water, salt(s) and urea;	One correctly named salt		
	ii		1	Increased/ becomes stronger/ gets higher;			
Total Mark			5				

24.

Question		Marking details	Marks Available
(a)	(i)		2

2 (3) correct lines;;

1 correct = 1 mark, 2 correct = 2 marks

	(ii)	Excretion;	1
(c)	(i)	Dialysis;	1
	(ii)	Regular {hospitalisation/treatment} / diet restrictions/ temporary/ every time they have {dialysis/ treatment} several tir	1
		Question Total	[4]

25.

Question			Marking details	Marks Available
(a)			Removal of waste;	1
(b)	(i)		68;	1
	(ii)	I	The salts enter urine/ excreted/ some are reabsorbed;	1
		II	Concentration increases; Because water intake lower **and** percentage of intake that passes into urine is lower'/ because the volume of urine is lower;	2

26.

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
5	(a)			ureter (carries urine out of kidney) correct spelling	1			1		
	(b)	(i)		Urea		1		1		
		(ii)		Less protein {in blood /leaving kidney}/ owtte (1) No change in glucose concentration/ owtte (1)			2	2		
	(c)			Any three (x1) from: 1. Survival declines with years after transplant 2. People survive longer with transplants from living donors 3. People survive longest with transplants from relatives/family 4. Difference between family donors and others increases with years after the transplant			3	3		

27.

Sub-section			Mark	Answer	Accept	Neutral answer	Do not accept
(a)			1	Decrease in water (in blood) / low water content (of blood)/ increase in concentration of blood;			Lack of water
(b)			3	More water (re)absorbed; Into the {blood/ capillaries}; Urine {becomes more concentrated/ contains less water};		Smaller volume	
Total Mark			4				

28.

Question		Marking details	Marks Available
	(ii)	Protein (molecules) too big to pass through {filter/capillaries/ glomerulus/ Bowmans capsule};	1
(b)		Any **three** from: number in <u>each group</u>; age; gender; period of time of treatment; diet (food or water); NOT amount species; type; {dose/mass/volume} of {endaravone/drug}	3
(c)		Repeat/ larger sample;	1

29.

Marking details	Marks Available
Indicative content	6

The brain monitors whether there is too much water in the blood, and so little ADH is released. Dilute urine is excreted because the kidney tubules do not absorb much water to pass it back to the blood. If there is too little water in the blood, then more ADH is released causing concentrated urine to be excreted because the kidney tubules absorb a lot of water and pass it into the blood.

5-6 marks
The candidate constructs an articulate, integrated account correctly linking relevant points, such as those in the indicative content, which shows sequential reasoning. The answer fully addresses the question with no irrelevant inclusions or significant omissions. The candidate uses appropriate scientific terminology and accurate spelling, punctuation and grammar.

3-4 marks
The candidate constructs an account correctly linking some relevant points, such as those in the indicative content, showing some reasoning. The answer addresses the question with some omissions. The candidate uses mainly appropriate scientific terminology and some accurate spelling, punctuation and grammar.

1-2 marks
The candidate makes some relevant points, such as those in the indicative content, showing limited reasoning. The answer addresses the question with significant omissions. The candidate uses limited scientific terminology and inaccuracies in spelling, punctuation and grammar.

0 marks
The candidate does not make any attempt or give a relevant answer worthy of credit

Question 29 Total **[6]**

30.

Question			Marking details	Marks available					
				AO1	AO2	AO3	Total	Maths	Prac
(a)	(i)		filtration under pressure/ultrafiltration (1) small molecules/ correctly named small molecules e.g. {glucose/ urea/ water/ salts/ amino acids} {move from the capillary knot/ glomerulus/ into the Bowman's capsule} (1)	2			2		
	(ii)		It has been (selectively) reabsorbed into the {blood/ capillaries}		1		1		
	(iii)		(proximal convoluted) tubule	1			1		
(b)			water has been {reabsorbed/ taken back into blood} (therefore % composition changed)		1		1		
			Question 30 Total	**3**	**2**	**0**	**5**	**0**	**0**