Question Number	Answer	Acceptable answers	Mark
1(a)(i)	**D** sebaceous gland		**(1)**

Question Number	Answer	Acceptable answers	Mark
1(a)(ii)	A description linking **two** of the following points: the sweat gland releases water / sweat onto (the surface of the skin) (1) the water evaporates (1) by removing heat from the surface of the skin / heat energy lost as latent heat(1)	Accept cooling effect	**(2)**

Question Number	Answer	Acceptable answers	Mark
1(a)(iii)	An explanation linking **two** of the following points: the (erector) muscle raises the hair (1) the hair traps **air** (next to the surface of the skin) (1) this acts as an insulator (1) causing more heat to be retained in the body (1)	Ignore references to hair follicle standing up	**(2)**

Question Number	Answer	Acceptable answers	Mark
1(b)	**A** homeostasis		**(1)**

Question Number	Answer	Acceptable answers	Mark
1(c)	An explanation linking **two** of the following points: this is the optimum temperature (1) involving enzymes (1) for chemical reactions in the body /metabolic reactions (1) denaturation occurs at higher temperatures / at lower temperatures reactions are slower (1)	Named chemical reactions e.g. digestion	**(2)**

Question Number	Answer	Acceptable answers	Mark
1(d)	An explanation linking **two** of the following points: reptiles are poikilothermic / ectothermic(1) they cannot generate heat to maintain their own body temperature (1) (so use the sun) to warm their bodies (1) for chemical reactions to occur (quickly) (1)	use the environment to control body temperature / internal temp is dependent on external temp	**(2)**

(Total for question 1 = 10 marks)

Question Number	Answer	Acceptable answers	Mark
2(a)(i)	B – 1.1		**(1)**

Question Number	Answer	Acceptable answers	Mark
2(a) (ii)	continuous (data / variation)		**(1)**

Question Number	Answer	Acceptable answers	Mark
2(a) (iii)	$\frac{18}{60}$ (1) 0.3 x 100 = 30(%) (1) Or 0.33 x 100 = 33(%) (1)	correct answer 2 marks	**(2)**

Question Number	Answer	Acceptable answers	Mark
2(b) (i)	An explanation to include **four** of the following: • **hypothalamus** controls body temperature(1) • causing the body to sweat (more) (1) • (sweating cools the body by) **evaporation** of water / sweat (1) • vasodilation (of blood vessels) (1) • heat lost by **radiation** (1) • this is called negative feedback (1)	explanation of vasodilation – more blood flowing near surface of skin hairs lie flat on skin (so no insulation) (1)	**(4)**

Question Number	Answer	Acceptable answers	Mark
2(b) (ii)	An explanation to include **two** of the following: • muscles (contract and relax)(1) • friction (1) • releasing heat by respiration (1)		**(2)**

(Total for question 2 = 10 marks)

Question Number	Answer	Acceptable answers	Mark
3 (a)(i)	A description including two of the following points • initial /at the start increase in concentration (1) • 06.00 to 08.00 / 12.00 to 13.00 (1) • decrease in concentration after 08.00 / fall in concentration between 08.00 and 12.00 (1) • increased again at 13.00 (1)	accept specific times eg. at 8.00 concentration high	**(2)**

Question Number	Answer	Acceptable answers	Mark
3(a) (ii)	• increase due to food intake (1) • decrease due to glucose being used up / stored /insulin released / doing exercise(1)	accept 8:00 or 13:00 for increase answers must be linked to idea of increase or decrease not simply eating food	**(2)**

Question Number	Answer	Acceptable answers	Mark
3(a)(iii)	glycogen in the liver		**(1)**

Question Number	Answer	Acceptable answers	Mark
3(b)(i)	substitution (1) $1.50^2 = 2.25$ or $67.5 / 1.5^2$ (1) evaluation (1) $67.5 \div 2.25$ = BMI of 30	 accept 45 (1) (as this is the correct calculation without squaring the 1.5) give full marks for correct answer, no working	**(2)**

Question Number	Answer	Acceptable answers	Mark
3(b)(ii)	An explanation including the following points • physical activity can be performed (to reduce glucose levels) (1) • diet can be controlled (to reduce glucose levels) (1) • take medication (orally or injected) (1)	 accept insulin/ metformin for medication	**(3)**

(Total for question 3 = 10 marks)

Question Number	Answer	Acceptable answers	Mark
4a(i)	**C** ☒ hypothalamus		**(1)**

Question Number	Answer	Acceptable answers	Mark
4(a)(ii)	An explanation linking **four** of the following: vasodilation occurs when the body is hot (1) blood vessels near the surface of the skin widen / the blood vessels increase the amount of blood flow near the surface of the skin (1) vasoconstriction occurs when the body is cold (1) blood vessels near the surface narrow /the blood vessels reduce the blood flow near the surface of the skin (1)	accept: description of shunt valve (1)	**(4)**

Question Number	Answer	Acceptable answers	Mark
4(b)	osmoregulation		**(1)**

Question Number		Indicative Content	Mark
QWC	***4(c)**	An explanation to include some of the following points: lowering blood glucose concentrations • insulin is released • from the pancreas • into the bloodstream • causing glucose to be converted to glycogen • stored in the liver / muscle tissue • blood glucose concentrations are lowered raising blood glucose concentrations • glucagon is released • from the pancreas • into the bloodstream • causing glycogen to be converted to glucose • glucose released into the bloodstream • blood glucose concentrations are raised	**(6)**
Level	**0**	No rewardable content	
1	**1 - 2**	• a limited explanation of either lowering or raising glucose concentrations in the blood • the answer communicates ideas using simple language and uses limited scientific terminology • spelling, punctuation and grammar are used with limited accuracy	
2	**3 - 4**	• a simple explanation of both lowering and raising glucose concentrations in the blood or a detailed explanation of one of them • the answer communicates ideas showing some evidence of clarity and organisation and uses scientific terminology appropriately • spelling, punctuation and grammar are used with some accuracy	
3	**5 - 6**	• a detailed explanation of both raising and lowering blood glucose concentrations including the role of the hormones and the role of glycogen. • the answer communicates ideas clearly and coherently uses a range of scientific terminology accurately • spelling, punctuation and grammar are used with few errors	

Total for question 4 – 12 marks