PEARSON EDEXCEL GCSE BIOLOGY (HIGHER) · 1BI0

BIOLOGY



MARK SCHEME

TOPIC 7: ANIMAL COORDINATION, CONTROL AND HOMEOSTASIS (PACK 1)

SCORE	PERCENTAGE
/51	%

STEMUP

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Mark Scheme

Q1.

	Answer	Acceptable answers	Mark
(a)(i)	2.7	Allow -2.7 (°C)	**(1)**
(a)(ii)	a comparison to include the following linked points (Rebecca's) brain temperature fluctuated / stayed similar / did not change very much (1) (whereas) finger temperature decreased (1)	Ignore references to brain temperature going up	**(2)**
(a)(iii)	an explanation to include three of the following points heat lost to the environment /from finger (1) **less**blood delivered to the skin's surface/finger (1) narrowing of the arterioles near the skin's surface (1) vasoconstriction (1) **less**heat loss by radiation(1)	accept ref to temperature gradient accept more blood flow to vital organs accept blood vessels for arterioles	**(3)**

		Indicative Content	
	***(b)**	A explanation to include some of the following • homeostasis / regulation of the body's interna • controlled by the hypothalamus / thermoregul • hypothalamus / thermoregulatory centre moni temperature • negative feedback mechanism • sweat rate increases	

		• sweat glands will release sweat on to skin surf • evaporation of this sweat / water will remove h from skin • hairs on skin's surface lay flat • no trapping of insulating air layer so body lose • vasodilation occurs • widening of the arterioles / blood vessels eq, n delivers warm blood to skin surface • body loses heat by radiation	
Level	**0**	No rewardable content	
1	**1 - 2**	• a limited explanation of at least one method of thermoregulation • 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 including at least two methods of thermoregulation • 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 at least 3 methods of thermo regulation. Use of the term vasodilation or including information on the process of homeostasis • the answer communicates ideas clearly and coherently uses a range of scientific terminology accurately • spelling, punctuation and grammar are used with few errors	

Q2.

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

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

Question Number	Answer	Acceptable answers	Mark
(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
(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)**

Q3.

Question Number	Answer	Mark
	An explanation that combines identification - application of knowledge (1 mark) and reasoning/justification – application of understanding (2 marks): • if blood glucose levels become too low glucagon is released (1) • from the pancreas (1) • causing glycogen in the liver/muscles to be converted back to glucose (1) • returning blood glucose levels to normal (1)	**(3)**

Q4.

	Answer	Acceptable answers	Mark
	A description linking **three** of the following: • glucagon is released (1) • from the pancreas (1) • glycogen to glucose (1) • in the liver / muscle cells(1) • which acts to raise blood glucose levels (1)	correct spelling of glycogen and glucagon only No mark for glucagon is injected Ignore references to glucagon turning into glucose	**(3)**

Q5.

Question Number	Answer	Additional Guidance	Mark
(i)	An explanation linking: • inhibits {FSH / LH} (1) • which prevents {maturation of a follicle / ovulation} (1)	ignore prevents production of eggs accept thickens **cervical mucus** (1) accept thickens **cervical mucus** blocks the sperm / stops them reaching the egg for 2 marks	**(2)** **AO2**

Question Number	Answer	Additional guidance	Mark
(ii)	doesn't prevent STI	Accept STDs for STIs Accept named STIs accept still a chance of pregnancy	**(1)** **AO1**

Q6.

Question Number	Answer	Mark
(i)	ovary / ovaries	**(1)** **AO1 1**

Question Number	Answer	Additional guidance	Mark
(ii)	An explanation linking **four** from: • inhibits the production of FSH (1) • FSH causes eggs to mature in the follicle / (no FSH means) no eggs will be matured (1) • high levels of progesterone inhibit the production of LH (1) • LH causes ovulation / (no LH) prevents ovulation (1) • if eggs are not matured and released they cannot be fertilised (1)	accept thicker cervical mucus to prevent the sperm from reaching the egg (2)	**(4)** **AO1 1**

Q7.

Question number	Answer	Mark
	Any **two** from: • **starting** temperature of water (1) • volume of water (1) • number of layers / mass of tissue paper (1) • {size/volume} flask (1)	**(2)** AO2.2

Q8.

Question number	Answer	Additional guidance	Mark
	ADH / Anti diuretic hormone /vasopressin	accept phonetic spellings of anti diuretic hormone	**(1)** AO 1 1

Q9.

Question number	Answer	Additional guidance	Mark
(i)	causes the thyroid gland to enlarge / swell / increase thyroxine production (1)		**(1)** **AO2.1**

Question number	Answer	Mark
(ii)	C endocrine system The only correct answer is **C** endocrine system A is incorrect because the circulation involves the movement of blood around the body B is incorrect because the digestive system involves the breakdown of food D is incorrect because the urinary system deals with the removal of excretory products	**(1)** **AO1.1**

Q10.

Question number	Answer	Additional guidance	Mark
	An answer including: • (breakdown of) amino acids (1) • in the liver (1)	 accept: deamination in the liver for 2 marks	**(2)** AO1 1

Q11.

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

Q12.

	Answer	**Acceptable answers**	**Mark**
	An explanation linking **two** of the following: • rising oestrogen levels (1) • (stimulate production of) LH (1) • (LH) levels increase / when it reaches a set level / peaks (which causes ovulation) (1)	accept high oestrogen levels / oestrogen peaks / oestrogen released	**(2)**

Q13.

Question Number	**Answer**	**Additional guidance**	**Mark**
	a labelled line X to either kidney	accept X written on a kidney	**(1)** **AO2 1**

Q14.

Question Number	Answer	Additional guidance	Mark
(i)	substitution 172 – 1.4 =170.6 (1) evaluation 170.6 ÷ 172 = 99.186 (1) correct to 2 dec places 99.19%	award full marks for correct numerical answer without working accept other methods of calculating this percentage	(3)

Question Number	Answer	Mark
(ii)	volume of water produced will be lower	(1)

Question Number	Answer	Additional guidance	Mark
(iii)	An explanation that combines identification - application of knowledge (1 mark) and reasoning/justification – application of understanding (2 marks): • water moves (from the collecting duct) into the bloodstream (1) • by osmosis (1) • from where it is in high water concentration in the collecting duct to low water concentration in the bloodstream (1)	accept down a concentration gradient	(3)

Q15.

Question Number	Answer	Acceptable answers	Mark
(i)	**A** ☒ FSH		**(1)**

Question Number	Answer	Acceptable answers	Mark
(ii)	**An explanation linking two of the following** more than one egg {released / fertilised }(1) multiple birth / pregnancy (1) increased risk of complications for mother/babies (1) OR women affected by side effects (1) treatment has to be stopped reducing chance of pregnancy (1)	 accept headaches, mood swings, nausea, abdominal pain, diarrhoea, weight gain ignore references to cost	**(2)**

Question Number	Answer	Acceptable answers	Mark
(iii)	**D** ☒ progesterone		**(1)**

Q16.

Question Number	Answer	Mark
	A amino acids **The only correct answer is A** ***B*** *is not correct because sugars are not converted to urea in the liver* ***C*** *is not correct because lipids are not converted to urea in the liver* ***D*** *is not correct because potassium ions are not converted to urea in the liver*	**(1)** **AO1 1**

Q17.

Question number	Answer	Mark
(i)	C hypothalamus **1. The only correct answer is C** ***A*** *is not correct because the cerebellum is the main centre for balance not thermoregulation* ***B*** *is not correct because the cerebral cortex is the main area for higher thinking skills and logic not thermoregulation* ***D*** *is not correct because the pituitary gland releases hormones it is not the thermoregulatory centre*	**(1)** AO 1 1

Question number	Answer	Additional guidance	Mark
(ii)	An explanation linking the following: • vasodilation acts to cool the body down (1) • more blood flows near the surface of the skin (1) • less blood flows through the shunt valve (1) • causing increased **thermal** energy loss (1)	 accept capillaries widen near the surface of the skin. reject moving blood vessels. accept energy loss by **radiation**	**(4)** AO 1 1

Q18.

Question number	Answer	Mark
	C hypothalamus **A.** *is not correct because the cerebellum is for autonomic reactions* ***B*** *is not correct because the medulla oblongata does not control temperature* ***C*** **The only correct answer is C** ***D*** *is not correct because the pituitary gland releases hormones*	**(1)** AO1 1

Q19.

Question number	Answer	Additional guidance	Mark
(i)	pituitary (gland)	accept phonetic spelling	**(1)** AO1 1

Question number	Answer	Additional guidance	Mark
(ii)	A description including: • one or more ova will start to **mature** (1) • (inside the) follicles (1) • oestrogen is released (1)	 accept eggs will mature	**(2)** AO2 1

Question number	Answer	Mark
(iii)	**A LH** **A. The only correct answer is A** ***B** is not correct because FSH stimulates the follicles to mature oocytes* ***C** is not correct because it is not a hormone associate with the menstrual cycle* ***D** is not correct because it maintains the lining of the uterus it does not cause ovulation*	**(1)** AO1 1

Question number	Answer	Mark
(iv)	An explanation linking two from: • (day 20) is after ovulation / after the egg has been released (1) • so the corpus luteum produces progesterone (1) • to maintain the **lining** of the uterus (1)	**(2)** AO2 1

Q20.

Question Number	Answer	Mark
(i)	B female condom **The only correct answer is B** ***A*** *is incorrect because oral contraception contains hormones* ***C*** *is incorrect because the rhythm (calendar) method does not involve a barrier* ***D*** *is incorrect because the contraceptive implant contains hormones*	**(1)** **AO1 1**

Question Number	Answer	Additional guidance	Mark
(ii)	barrier methods prevent the transmission of STIs	accept STDs / accept named STIs accept for extra protection against pregnancy	**(1)** **AO2 1**