PEARSON EDEXCEL GCSE COMBINED SCIENCE (HIGHER) · 1SC0

BIOLOGY



MARK SCHEME

TOPIC 7: ANIMAL COORDINATION, CONTROL AND HOMEOSTASIS (PAPER 2)

SCORE	PERCENTAGE
/119	%

STEMUP

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Mark Scheme

Q1.

Question Number		Indicative Content	Mark
QWC	*	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	

Q2.

Question number	Answer	Additional guidance	Mark
(i)	• 156 ÷ 10 (1) • 16 units (1) Answer to two significant figures	award full marks for correct numerical answer without working	**(2)**

Question number	Answer	Mark
(ii)	An explanation that combines identification – application of knowledge (1 mark) and reasoning/justification – application of understanding (1 mark): • an increase in the units of insulin injected would cause more blood glucose to be converted to glycogen and stored in the liver/muscles (1) • leading to blood glucose levels becoming critically low/person would become hypoglycemic (1)	(2)

Q3.

Question number	Answer	Mark
(i)	B	(1)

Question Number	Indicative content	Mark
* (ii)	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. 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. **AO1 (6 marks)** • the thyroid gland produces thyroxine • thyroxine helps to regulate metabolic rate • low levels of thyroxine should stimulate the production of TRH • TSH being produced and more thyroxine being released • an underactive thyroid would cause less thyroxine to be produced • metabolic rate to drops • less energy (calories) are available for tasks • more fat storage so the person gains body mass	(6)

Level	Mark	Descriptor
	0	No rewardable material.
Level 1	1–2	• Demonstrates elements of biological understanding, some of which is inaccurate. Understanding of scientific ideas lacks detail. (AO1) • Presents an explanation with some structure and coherence. (AO1)
Level 2	3–4	• Demonstrates biological understanding, which is mostly relevant but may include some inaccuracies. Understanding of scientific ideas is not fully detailed and/or developed. (AO1) • Presents an explanation that has a structure which is mostly clear, coherent and logical. (AO1)
Level 3	5–6	• Demonstrates accurate and relevant biological understanding throughout. Understanding of the scientific ideas is detailed and fully developed. (AO1) • Presents an explanation that has a well-developed structure which is clear, coherent and logical. (AO1)

Q4.

Question Number	Answer	Additional guidance	Mark
	substitution $124 \div 1.8^2$ (1) evaluation BMI = 38.27	award 2 marks for correct answer with no working accept 38 / 38.3 accept 68.9 / 68.89 for 1 mark accept answers correctly rounded to any number of decimal places	**(2)** **AO1 1**

Q5.

Question number	Answer	Additional guidance	Mark
	(32 600 000 ÷ 100) x 13.2 / 4 303 200 / 4.3 million (1) (100 – 98.8) = 1.2 (1) 51 638	accept 32.6 million x 0.132 accept any correct rounding up to 4.3 million accept 0.012 (1) accept a calculation of 98.8% accept 51 600 for 3 marks accept 51 638.4 for 2 marks award full marks for correct answer without working accept alternative methods of calculation	**(3)** AO2 1

Q6.

	Answer	Acceptable answers	Mark
(i)	Calculation (1.7 × 1.7) = 2.89 (1) 78 / 2.89 = 27 (1)	Two marks for correct bald answer Ecf for incorrect numbers but correct calculation 26.98 / 26.9 Accept continued decimal places	**(2)**
(ii)	**C** ☒ overweight		**(1)**

Q7.

	Answer	Acceptable answers	Mark
	An explanation linking: • Uterus lining maintained/ thickened (more) (1) With one of:	Reject: repairs	**(2)**

	• Because progesterone levels maintained / progesterone is still produced • So that the embryo can embed on it / So that the uterus lining can supply the embryo with nutrients		

Q8.

Question Number	Answer	Additional Guidance	Mark
	An answer including **four** from: • {TSH / thyroxine} levels are higher than normal (1) • TSH stimulates the thyroid gland / TSH stimulates the release of thyroxine (1) • **increases** metabolic rate (1) • {red blood cells / glucose} are within the normal range (1) • suggesting oxygen is carried as normal (1) • the symptoms are not due to diabetes (1)	accept the hormones levels are high / above average accept digests / breaks down food faster accept hyperthyroidism / overactive thyroid accept RBC / glucose are not high accept is not anaemic	**(4)** **AO3** **1a, 1b, 2a, 2b**

Q9.

Question number	Answer	Mark
(i)	• person 2 had a slightly higher blood glucose level than person 1 after fasting (by up to 0.2 mmols/l) (1)	(1)

Question number	Answer	Mark
(ii)	• person 3 had a much higher blood glucose level than person 1 two hours after taking glucose (up by up to 5.6 mmols/l) (1)	(1)

Question number	Answer	Mark
(iii)	Insulin	(1)

Q10.

Question number	Answer	Additional Guidance	Mark
(i)	the size/mass of the biscuits is not known	accept: biscuits come in various sizes and weights	(1)

Question number	Answer	Additional Guidance	Mark
(ii)	An explanation that combines identification via a judgement (1 mark) to reach a conclusion via justification/reasoning (1 mark): • type 2 diabetics are not able to regulate the glucose levels in their body (1) • and this variety has less sugar (1)	accept: 0.4g compared to 16.1g	(2)

Q11.

	Answer	Acceptable answers	Mark
(i)	A description including the following points: • as mean mass increases so does the percentage of population with type 2 diabetes (1) • correct readings from the graph to illustrate the comparative point (1)	**accept**positive correlation ORA	**(2)**
(ii)	A suggestion linking **two**of the following: • increasing body mass leads to over weight / obesity • don't respond to insulin / reference to insulin resistance		**(2)**

Q12.

Question Number	Answer	Additional guidance	Mark
(i)	A description including: • blood glucose concentration increased from {0 – 8 hours / from 100 to 139 / by 39 mg/dL} (1) • then blood glucose concentration decreased [at 12 hours / to 90 mg/dL / by 49 mg/dL) (1) • blood glucose concentration increased {at 20 hours / after 12 hours / to 134 mg/dL / by 44 mg/dL} (1)	accept blood glucose concentration increased {at 24 hours / to 137 mg/dL / by 47 mg/dL} accept other calculated increases between 12 and 24 hours	(3) AO3 1 a + b

Question Number	Answer	Additional guidance	Mark
(ii)	An explanation linking: • the pancreas produced insulin (1) • but the cells in the {liver / muscles} were resistant to insulin (1) • so glucose was not taken up by the {liver / muscles / cells} (1)	 accept but there is insulin resistance accept so the glucose is not converted to glycogen in the {liver / muscles}	(3) AO2 1

Question Number	Answer	Additional guidance	Mark
(iii)	An explanation linking: • the blood glucose concentration decreased (at 12 hours) (1) • because the patient has used up the glucose in his blood (1) • due to increased respiration (during exercise) (1)	 accept glucose used by {muscles / cells}	**(3)** **AO3 2ab**

Q13.

Question number	Answer	Mark
(i)	An answer that combines points of interpretation/evaluation to provide a logical description: • levels remain low up until day 14 then rise (1) • they continue to rise to day 23 and drop at day 24 (1)	**(2)**

Question number	Answer	Mark
(ii)	An explanation that combines identification – understanding (1 mark) and reasoning/justification – understanding (1 mark): • as ovulation occurs (1) • the levels of progesterone released from the corpus luteum increases to maintain the lining of the uterus (1)	**(2)**

Question number	Answer	Mark
(iii)	An explanation that combines identification via a judgment (1 mark) to reach a conclusion via justification/reasoning (1 mark): • progesterone levels fall after day 23 to 17.11 (1) • so uterus wall thickness is not maintained and therefore pregnancy has not occurred (1)	**(2)**

Q14.

	Answer	Acceptable answers	Mark

(a)(i)	A description including the following points: • as mean mass increases so does the percentage of population with type 2 diabetes (1) • correct readings from the graph to illustrate the comparative point (1)	**accept**positive correlation ORA	**(2)**
(a)(ii)	A suggestion linking **two**of the following: • increasing body mass leads to over weight / obesity • don't respond to insulin / reference to insulin resistance		**(2)**
(b)(i)	Calculation (1.7 × 1.7) = 2.89 (1) 78 / 2.89 = 27 (1)	Two marks for correct bald answer Ecf for incorrect numbers but correct calculation 26.98 / 26.9 Accept continued decimal places	**(2)**
(b)(ii)	**C** ☒ overweight		**(1)**
(c)	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)**

Total for question = 10 marks

Q15.

Question Number	Answer	Additional guidance	Mark
	An explanation linking **four** from: **Clomifene (maximum two marks)** • clomifene therapy introduces hormones into the body / stimulates hormones {LH / FSH} (1) • to allow (more) eggs to {develop / be released} (1) **IVF (maximum two marks)** • IVF involves fertilisation outside the body (1) • so a fertilised egg cell can be implanted directly into the uterus (1) • so if Fallopian tubes are blocked there can still be pregnancy (1)	accept womb for uterus accept alternative reasons for using IVF	**(4)** **AO1 1**

Q16.

Question number	Indicative content	Mark
	AO1 • There are four hormones involved in the menstrual cycle oestrogen, progesterone, LH and FSH • At the start of the cycle FSH causes the egg to develop in the follicle • FSH is released from the pituitary gland • As progesterone and oestrogen levels are low • Oestrogen levels start to rise • Oestrogen is released from the ovaries • This causes the lining of the uterus to build up • High levels cause a surge of LH • Released from the pituitary gland • Causing ovulation • An egg is released from the ovary • Progesterone is produced • From the corpus luteum • This caused the lining of the uterus to be maintained • If an egg is fertilised oestrogen and progesterone levels remain high • To maintain the lining of the uterus	**(6)** **AO1.1**

Level	Mark	Descriptor
	0	• No rewardable material.
Level 1	1-2	• Demonstrates elements of biological understanding, some of which is inaccurate. Understanding of scientific ideas lacks detail. (AO1) • Presents an explanation with some structure and coherence. (AO1)
Level 2	3-4	• Demonstrates biological understanding, which is mostly relevant but may include some inaccuracies. Understanding of scientific ideas is not fully detailed and/or developed. (AO1) • Presents an explanation that has a structure which is mostly clear, coherent and logical. (AO1)
Level 3	5-6	• Demonstrates accurate and relevant biological understanding throughout. Understanding of the scientific ideas is detailed and fully developed. (AO1) • Presents an explanation that has a well-developed structure which is clear, coherent and logical. (AO1)

Level	Mark	Descriptor
	0	• No rewardable material.
Level 1	1-2	• Either a list of two or more hormones or a hormone linked to its role in the menstrual cycle/or the endocrine gland it is released from • There must be a coherent flow to the answer linking the correct hormone with the correct role
Level 2	3-4	• At least two hormones of the menstrual cycle linked to their role or the endocrine they are released from • Answer must be correctly linked and in a logical order although the candidate may start at any point within the menstrual cycle
Level 3	5-6	• Links at least three hormones of the menstrual cycle to their role and endocrine gland they are released from • Answer must be logically ordered and links must be correctly made only minor errors are acceptable

Level	Mark	Examples of possible responses
	0	• No rewardable material.
Level 1	1	• FSH and LH control the menstrual cycle / LH controls ovulation and the uterus thickening (note an error here)
	2	• LH controls ovulation
Level 2	3-4	• Oestrogen causes the uterus lining to thicken and LH to be released • Oestrogen causes the uterus lining to thicken and LH to be released from the pituitary gland
Level 3	5-6	• FSH causes the egg to mature in the follicle, oestrogen causes the thickening of the uterus lining and causes LH to be released which results in ovulation. • FSH and LH are released from the pituitary gland, Oestrogen and progesterone are released from the ovaries. FSH causes the egg to mature in the follicle, oestrogen causes the thickening of the uterus lining and causes LH to be released which results in ovulation.

Q17.

Question number	Answer	Mark
	An explanation including **four** of the following: • Low levels of thyroxine cause TRH to be produced (1) • (TRH is produced) in the hypothalamus (1) • this causes TSH to be released (1) • (TSH is released) from the pituitary (1) • (TSH causes the) thyroid gland to produce thyroxine (1) • As thyroxine levels increase it inhibits the {release of TRH / production of TSH} (1)	**(4)** **AO1.1**

Q18.

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**

Q19.

Question number	**Answer**	**Additional guidance**	**Mark**
	An explanation linking four of the following: • adrenalin acts to increase heart rate / blood pressure (1) • so there is increased blood flow (1) • causes the release of glucose from glycogen (1) • so increased {oxygen/glucose} (1) • increased the rate of respiration (1) • to **release energy** (for the working muscles/body) (1)	accept more glucose released from liver/muscles accept ATP for energy	**(4)** AO 1 2

Q20.

Question number	Answer	Mark
(i)	An explanation linking **two** of the following: • women over the age of 50 have low levels of oestrogen (1) • (high levels of) oestrogen are needed for **LH** to be released / levels of oestrogen are too low for **LH** to be released (1) • (a surge of) LH is needed for ovulation to occur (1)	**(2)** AO 3 1a AO 3 1b

Question number	Answer	Additional guidance	Mark
(ii)	An explanation linking: • low levels of oestrogen (1) • (low levels of oestrogen) stops the lining of the uterus building up / so no lining to be lost (1)	reject progesterone	**(2)** AO3 2a AO3 2b

Question number	Answer	Additional guidance	Mark
(iii)	An explanation linking the following: • causes the release of FSH (1) • stimulating eggs to develop (in the follicles/ovary) (1) OR • causes the release of LH (1) • stimulating ovulation (1)	accept stimulates follicles to mature	**(2)** AO 2 1

Question number	Answer	Mark
(iv)	A corpus luteum **1. The only correct answer is A** ***B*** *is not correct because The pituitary gland releases the hormones LH and FSH not progesterone* ***C*** *is not correct because the thyroid gland releases TSH and thyroxine not progesterone* ***D*** *is not correct because the uterus does not release any hormones it is the site of the action of progesterone*	**(1)** AO 1 1

Q21.

Question Number	Answer	Additional Guidance	Mark
	An explanation linking: • blood glucose levels are not regulated / high (1) • because cells are resistant to insulin (1) • (so the liver) does not convert glucose to glycogen (1)	 accept blood sugar levels accept there is insulin resistance / unresponsive to insulin reject immune accept hyperglycaemia / symptoms of hyperglycaemia (1)	**(3)** **AO1**

Q22.

Question number	Answer	Additional guidance	Mark
	An explanation linking: • to inhibit the production of FSH (1) • to prevent eggs maturing (1) OR • to inhibit the production LH (1) • so ovulation is prevented (1)	accept thickens mucus (1) to prevent sperm reaching the egg/ entering the uterus (1) accept thins lining of the uterus (1) so less chance of implanting (1)	**(2)** AO1 1

Q23.

Question Number	Answer	Acceptable answers	Mark
(a)	An explanation linking **four** of the following points: • (dehydration detected by) osmoreceptors/hypothalamus (1) • pituitary gland (1) • (releases more) ADH (1) • ADH acts on the nephron/collecting duct/tubules (1) • making the {collecting duct/tubules/nephron} more permeable (1) • so **more** water is reabsorbed (by the body/blood) (1)	ignore brain accept {small amount/concentrated} urine produced	**(4)**

Question Number	Answer	Acceptable answers	Mark
(b)(i)	**A** corpus luteum		**(1)**

Question Number	Answer	Acceptable answers	Mark
(b)(ii)	• uterus lining remains thick/uterus lining continues to grow (1)		**(1)**

Question Number		Indicative Content	Mark
QWC	**(b) (iii)***	A explanation to include some of the following points Stages and hormones • menstrual cycle consists of menstruation, uterus lining thickening and ovulation • hormones involved in the menstrual cycle are oestrogen, progesterone, FSH and LH Role of the hormones • FSH stimulates the follicles to mature • FSH stimulates the production of oestrogen • follicles secrete oestrogen • oestrogen is responsible for the repair of the uterus wall • high levels of oestrogen stimulate the release of LH • LH triggers ovulation • corpus luteum produces progesterone • progesterone maintains the lining of the uterus Control mechanisms • oestrogen inhibits the production of FSH • progesterone inhibits the production of LH • progesterone inhibits the production of FSH • menstruation is triggered by low levels of oestrogen and progesterone • Low progesterone levels cause FSH to be released	**(6)**

Level	**0**	No rewardable content
1	**1 - 2**	• A limited explanation of the menstrual cycle which might include at least one of the stages **or** some of the hormones involved **or** the role of one of the hormones involved • 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 the menstrual cycle including some of the stages **and** the role of at least two of the hormones involved • 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 the menstrual cycle including most of the hormones involved, their roles **and** at least one control mechanism • the answer communicates ideas clearly and coherently uses a range of scientific terminology accurately • spelling, punctuation and grammar are used with few errors

Q24.

Question number	Answer	Mark
(i)	**A** pituitary | ovaries	**(1)**

Question number	Answer	Mark
(ii)	An answer that combines a maximum of two points of interpretation/evaluation to provide a logical description: • as oestrogen level peaks the temperature is at its lowest (day 12)(1) • as oestrogen levels fall there is a temperature rise (days 12 – 15) (1) • temperature remains high with higher oestrogen levels (days 15 – 25)(1)	**(2)**

Question number	Answer	Additional Guidance	Mark
(iii)	An explanation that combines identification – application of knowledge (1 mark) and reasoning/justification – application of understanding (1 mark): • there is a drop in body temperature prior to ovulation (1) • identifies the time when the egg is released (1)	accept best time for intercourse to take place to increase the chance of fertilisation (1)	**(2)**

Q25.

Question number	Indicative content	Mark
*	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. 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. **AO1 (6 marks)** • FSH released by pituitary gland • stimulates eggs to mature in the follicle • FSH triggers a rise in oestrogen • oestrogen released from the ovaries • oestrogen causes the lining of the uterus to build up • high levels of oestrogen stimulate LH production • surge of LH from the pituitary gland • triggers ovulation • progesterone is produced by the corpus luteum • progesterone maintains the lining of the uterus • high levels of oestrogen and progesterone inhibit LH and FSH production • as progesterone levels fall menstruation occurs • low levels of progesterone and oestrogen restart the cycle	**(6)**

Level	Mark	Descriptor
	0	No rewardable material.
Level 1	1–2	• Demonstrates elements of biological understanding, some of which is inaccurate. Understanding of scientific ideas lacks detail. (AO1) • Presents an explanation with some structure and coherence. (AO1)
Level 2	3–4	• Demonstrates elements of biological understanding, which is mostly relevant but may include some inaccuracies. Understanding of scientific ideas is not fully detailed and/or developed. (AO1) • Presents an explanation that has a structure which is mostly clear, coherent and logical. (AO1)
Level 3	5–6	• Demonstrates accurate and relevant biological understanding throughout. Understanding of the scientific ideas is detailed and fully developed. (AO1) • Presents an explanation that has a well-developed structure which is clear, coherent and logical. (AO1)

Q26.

	Answer	Acceptable answers	Mark
(a)	Gametes correctly labelled (1) X X X Y Female zygote X X Male zygote X Y (1)	X X Y X	**(2)**
(b)	**A** ☒ enzymes to help get through the membrane of the egg cell		**(1)**
(c)	to supply / contain (a large amount of) nutrients / energy (for the zygote / embryo)	food /named nutrient Ignore references to foetus Reject baby	**(1)**
(d)	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)**

(e)	An explanation linking: • Uterus lining maintained/ thickened (more) (1) With one of: • Because progesterone levels maintained / progesterone is still produced • So that the embryo can embed on it / So that the uterus lining can supply the embryo with nutrients	Reject: repairs	**(2)**

Q27.

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**

Q28.

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

Q29.

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)**

Q30.

	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)**

Q31.

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**

Q32.

Question Number	Answer	Additional Guidance	Mark
(i)	adrenal (glands)	ignore kidney / adrenalin glands	**(1)** **AO1**

Question Number	Answer	Additional Guidance	Mark
(ii)	An explanation linking **three** from: • binds to **receptors** (on the liver) (1) • (triggers liver cells to) convert glycogen (1) • into glucose (1) • increasing the concentration (of glucose) in the blood / which is released into the blood (1)	ignore sugar accept blood sugar	**(3)** **AO2**

Q33.

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**

Q34.

	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)**

Q35.

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)**