

Questions

Q1.

Hormones can also be used to treat infertility.

Explain how clomifene therapy and IVF can improve female fertility.

(4)

clomifene therapy

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IVF

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(Total for question = 4 marks)

Q2.

*Explain how hormones control the menstrual cycle.

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(Total for question = 6 marks)

Q3.

Figure 17 shows the concentration of the hormones oestrogen and progesterone in the blood of women of different ages.

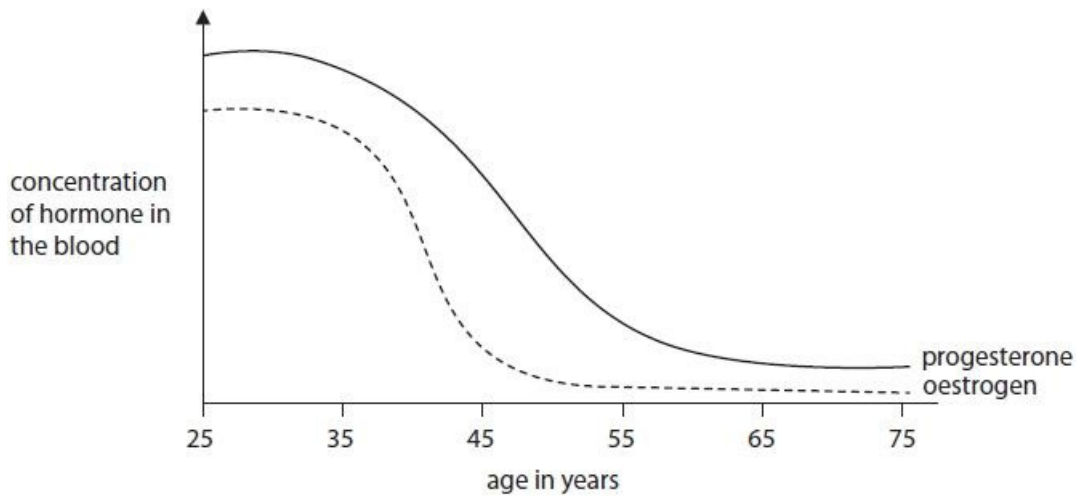


Figure 17

(i) Use information from Figure 17 to explain why women over the age of 50 are less likely to ovulate.

(2)

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(ii) Use information from Figure 17 to explain why women are less likely to menstruate after the age of 60.

(2)

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(iii) Explain how clomifene therapy may increase the chance of a woman over the age of 50 becoming pregnant.

(2)

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(iv) The hormone progesterone is produced by the

(1)

- A corpus luteum
- B pituitary
- C thyroid
- D uterus

(Total for question = 7 marks)

Q4.

Hormones are also used as a method of contraception.

Explain why taking high levels of oestrogen and progesterone in the combined contraceptive pill reduces the chance of pregnancy.

(2)

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(Total for question = 2 marks)

Q5.

Answer the question with a cross in the box you think is correct . If you change your mind about an answer, put a line through the box and then mark your new answer with a cross .

Methods of contraception include use of hormones and barrier methods.

(i) Which form of contraception is a barrier method?

(1)

- A oral contraception
- B female condom
- C rhythm (calendar) method
- D contraceptive implant

(ii) State why a barrier method of contraception may be used in addition to a hormonal method.

(1)

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(Total for question = 2 marks)

Q6.

(i) Women with the condition known as polycystic ovary syndrome (PCOS) do not ovulate regularly.

Women with PCOS can be treated using clomifene therapy.

Clomifene therapy stimulates the production of FSH.

Name the endocrine gland that produces FSH.

(1)

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(ii) During this therapy, a woman takes a clomifene tablet each day for the first five days of her menstrual cycle.

Describe the changes that would happen inside the ovaries during the first five days of this treatment.

(2)

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(iii) Which hormone causes ovulation?

(1)

- A LH
- B FSH
- C testosterone
- D progesterone

(iv) During clomifene therapy, the woman has a blood test on day 20 of the menstrual cycle.

The blood test shows a high level of progesterone.

Explain the cause of this high level of progesterone on day 20 of the menstrual cycle.

(2)

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(Total for question = 6 marks)

Q7.

The combined contraceptive pill contains the hormones oestrogen and progesterone.

(i) State the endocrine gland that releases oestrogen.

(1)

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(ii) Explain how high levels of oestrogen and progesterone in the combined contraceptive pill work together to prevent pregnancy.

(4)

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(Total for question = 5 marks)

Q8.

The combined contraceptive pill contains artificial versions of oestrogen and progesterone.

(i) Explain how the combined contraceptive pill prevents pregnancy.

(2)

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(ii) When taken correctly, the combined pill can be over 99% effective.

Taking the combined pill can lead to weight gain.

Give one other disadvantage of using the combined pill as the only method of contraception.

(1)

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(Total for question = 3 marks)

Mark Scheme

Q1.

Question Number	Answer	Additional guidance	Mark
	<p>An explanation linking four from:</p> <p>Clomifene (maximum two marks)</p> <ul style="list-style-type: none"> • clomifene therapy introduces hormones into the body / stimulates hormones {LH / FSH} (1) • to allow (more) eggs to {develop / be released} (1) <p>IVF (maximum two marks)</p> <ul style="list-style-type: none"> • 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) 	<p>accept womb for uterus</p> <p>accept alternative reasons for using IVF</p>	<p>(4)</p> <p>AO1 1</p>

Q2.

Question number	Indicative content	Mark
	AO1	(6)
	<ul style="list-style-type: none"> • 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 	AO1.1

Level	Mark	Descriptor
	0	<ul style="list-style-type: none"> • No rewardable material.
Level 1	1-2	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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)

Edexcel Biology GCSE - Menstrual Cycle and Fertility

Level	Mark	Descriptor
	0	<ul style="list-style-type: none"> No rewardable material.
Level 1	1-2	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> No rewardable material.
Level 1	1	<ul style="list-style-type: none"> FSH and LH control the menstrual cycle / LH controls ovulation and the uterus thickening (note an error here)
	2	<ul style="list-style-type: none"> LH controls ovulation
Level 2	3-4	<ul style="list-style-type: none"> Oestrogen causes the uterus lining to thicken and LH to be released which causes ovulation Oestrogen causes the uterus lining to thicken and LH to be released from the pituitary gland
Level 3	5-6	<ul style="list-style-type: none"> 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.

Q3.

Question number	Answer	Mark
(i)	<p>An explanation linking two of the following:</p> <ul style="list-style-type: none"> 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) 	<p>(2)</p> <p>AO 3 1a AO 3 1b</p>

Edexcel Biology GCSE - Menstrual Cycle and Fertility

Question number	Answer	Additional guidance	Mark
(ii)	<p>An explanation linking:</p> <ul style="list-style-type: none"> • 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)	<p>An explanation linking the following:</p> <ul style="list-style-type: none"> • causes the release of FSH (1) • stimulating eggs to develop (in the follicles/ovary) (1) <p>OR</p> <ul style="list-style-type: none"> • causes the release of LH (1) • stimulating ovulation (1) 	accept stimulates follicles to mature	(2) AO 2 1

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

Q4.

Question number	Answer	Additional guidance	Mark
	<p>An explanation linking:</p> <ul style="list-style-type: none"> to inhibit the production of FSH (1) to prevent eggs maturing (1) <p>OR</p> <ul style="list-style-type: none"> to inhibit the production LH (1) so ovulation is prevented (1) 	<p>accept thickens mucus (1) to prevent sperm reaching the egg/ entering the uterus (1)</p> <p>accept thins lining of the uterus (1) so less chance of implanting (1)</p>	<p>(2)</p> <p>AO1 1</p>

Q5.

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

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

Q6.

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: <ul style="list-style-type: none"> 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 <i>B is not correct because FSH stimulates the follicles to mature oocytes</i> <i>C is not correct because it is not a hormone associate with the menstrual cycle</i> <i>D is not correct because it maintains the lining of the uterus it does not cause ovulation</i>	(1) AO1 1

Question number	Answer	Mark
(iv)	<p>An explanation linking two from:</p> <ul style="list-style-type: none"> • (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) 	<p>(2)</p> <p>AO2 1</p>

Q7.

Question Number	Answer	Mark
(i)	ovary / ovaries	<p>(1)</p> <p>AO1 1</p>

Question Number	Answer	Additional guidance	Mark
(ii)	<p>An explanation linking four from:</p> <ul style="list-style-type: none"> • 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) 	<p>accept thicker cervical mucus to prevent the sperm from reaching the egg (2)</p>	<p>(4)</p> <p>AO1 1</p>

Q8.

Question Number	Answer	Additional Guidance	Mark
(i)	<p>An explanation linking:</p> <ul style="list-style-type: none"> inhibits {FSH / LH} (1) which prevents {maturation of a follicle / ovulation} (1) 	<p>ignore prevents production of eggs</p> <p>accept thickens cervical mucus (1)</p> <p>accept thickens cervical mucus blocks the sperm / stops them reaching the egg for 2 marks</p>	(2) AO2

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