AQA GCSE Biology | 8461

SPECIFICATION POINT 4.5.3.4

Hormones in human reproduction

Past-paper questions

Tier	**Higher**
Question groups	**22**
Available paper years	**2007–2023**

Using this booklet

1. Answer the questions in order and show your working.
2. Original question numbers and marks are retained.
3. Print at actual size (100%) for measuring questions.
4. Use the companion answer booklet to check your work.

Name: _____ **Date:** _____

Whole questions are retained for context, so some parts assess other specification points. Current and legacy sources are labelled. Continue on extra paper if needed.

4.5.3.4 Hormones in human reproduction

Question 01

June 2007 | BLY1A | Original Q2 | Legacy

QUESTION TWO

Hormones are involved in the menstrual cycle.

Match hormones, **A**, **B**, **C** and **D**, with the numbers **1–4** in the table.

A FSH

B FSH and LH

C LH

D oestrogen

	Function
1	stimulates egg release only
2	stimulates and inhibits production of hormones by the pituitary gland
3	stimulates the ovary to produce hormones and stimulates eggs to mature in the ovaries
4	the usual hormone treatment used in IVF treatment

4.5.3.4 Hormones in human reproduction

Question 02

June 2007 | BLY1H | Original Q5 | Legacy

5 A woman's fertility can be controlled by using hormones.

(a) Some contraceptive pills contain oestrogen.

Name the gland which produces oestrogen.

.....

(1 mark)

Women are being encouraged to use longer-term methods of contraception to reduce their chances of having an unwanted pregnancy.

The table summarises four long-term methods of contraception.

Method	What it is	How it works	How long does it last?	Chances of getting pregnant	Side effects
Hormone implant	Rod containing slow-release hormone inserted under the skin	Stops ovaries releasing eggs	3 years	Less than 1 in 1000	Acne in some women
Hormone injection	Injection that slowly releases hormone	Stops ovaries releasing eggs	12 weeks	Less than 4 in 1000	Weight gain in some women
IUD	Small plastic and copper coil placed in womb	Stops fertilised eggs developing in womb	5 – 10 years	Less than 20 in 1000	Heavier or more painful periods in some women
IUS	Plastic device containing slow-release hormone placed in womb	Stops fertilised eggs developing in womb	5 years	Less than 10 in 1000	Irregular periods in some women

(b) Which of the methods in the table is the most reliable?

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(1 mark)

4.5.3.4 Hormones in human reproduction

Question 02 · continued

BLANK

(c) What is the advantage of using long-term contraception methods instead of taking a contraceptive pill every day?

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(1 mark)

(d) The IUD is the least reliable of the contraceptive methods shown in the table.

Use information from the table to suggest a reason for this.

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(1 mark)

(e) Some people have ethical objections to the use of an IUD or an IUS.

Suggest **one** reason why people might object to their use.

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(1 mark)

(f) (i) Explain how the hormone in the implants prevents the ovary releasing eggs.

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(2 marks)

(ii) Hormones can also be used as 'fertility drugs'.

Explain how a fertility drug helps a woman to become pregnant.

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(2 marks)

9

4.5.3.4 Hormones in human reproduction

Question 03

November 2007 | BLY1A | Original Q6 | Legacy

QUESTION SIX

This question is about hormones and contraception.

6A Which line in the table is correct?

	FSH	Oestrogen
1	secreted by the pituitary gland	stimulates FSH production
2	causes eggs to mature	secreted by the pituitary gland
3	stimulates production of oestrogen	secreted by the ovaries
4	used in oral contraceptives	causes eggs to mature

6B Which of the following is true of the hormone LH?

1 The production of LH is stimulated by FSH.

2 It is produced by the ovary.

3 The production of LH is stimulated by a hormone from the ovaries.

4 It is used in contraceptive pills.

6C There are several types of contraceptive pill available for women.
One type of contraceptive pill contains oestrogen.

What is the effect of this type of contraceptive pill?

1 It inhibits the production of FSH.

2 It prevents a fertilised egg from implanting in the womb.

3 It prevents LH production.

4 It reduces the number of eggs released at ovulation.

4.5.3.4 Hormones in human reproduction

Question 03 · continued

6D The contraceptive pill has been linked to cervical cancer.
However, it is believed that most cases of cervical cancer are linked to a virus, HPV.
A new vaccine has been produced to combat HPV.

This vaccine . . .

1 will contain dead or weakened HPV viruses.

2 will contain antibodies against the HPV virus.

3 will destroy the HPV virus.

4 will cause the body to produce antibiotics.

Turn over for the next question

4.5.3.4 Hormones in human reproduction

Question 04

March 2008 | BLY1AP | Original Q8 | Legacy

QUESTION EIGHT

This question is about hormones that control the menstrual cycle.

8A The hormone which stimulates an egg to mature is produced by the . . .

1 blood.

2 ovary.

3 pituitary gland.

4 womb.

8B Some contraceptive pills contain high levels of oestrogen.

How do these contraceptives work?

1 They stop the lining of the womb from becoming thick.

2 They inhibit LH production.

3 They cause the lining of the womb to break down.

4 They inhibit FSH production.

8C Fertility drugs . . .

1 stimulate oestrogen production.

2 stimulate FSH production.

3 stimulate LH production.

4 stimulate the pituitary gland.

8D Some couples need IVF treatment in order to have children.

Which one of the following is an ethical problem that may occur as a result of IVF?

1 The treatment is suitable only for certain types of women.

2 The treatment is very expensive.

3 There is a high failure rate.

4 Unused embryos are destroyed.

4.5.3.4 Hormones in human reproduction

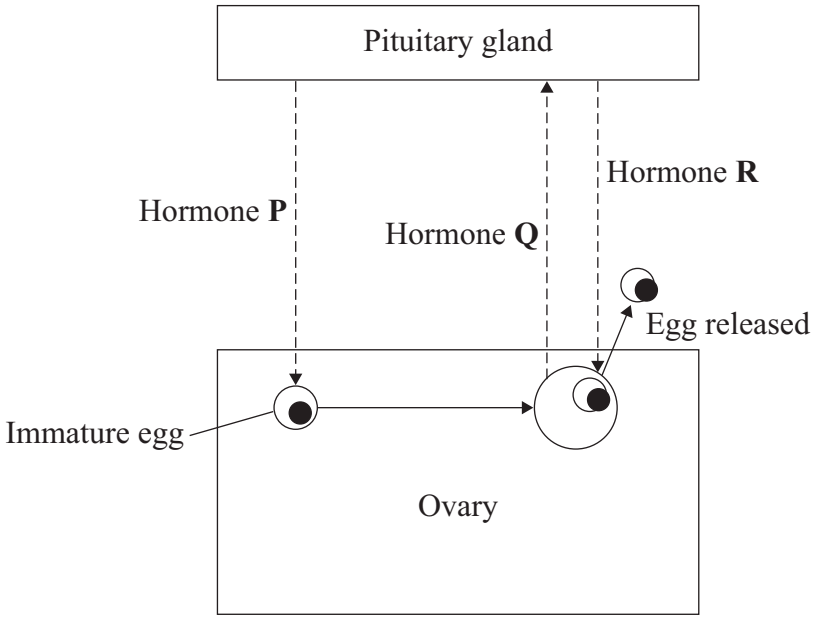
Question 05

June 2008 | BLY1AP | Original Q7 | Legacy

QUESTION SEVEN

Hormones produced in the body control the menstrual cycle.

The diagram shows how some hormones are involved in controlling the menstrual cycle.



7A Which line correctly identifies hormones **P**, **Q**, and **R**?

	P	**Q**	**R**
1	FSH	oestrogen	LH
2	LH	oestrogen	FSH
3	FSH	LH	oestrogen
4	oestrogen	FSH	LH

7B Oral contraceptives contain hormones that . . .

1 inhibit FSH production.

2 stimulate LH production.

3 prevent sperm cells from fertilising.

4 stimulate the pituitary gland to release more oestrogen.

4.5.3.4 Hormones in human reproduction

Question 05 · continued June 2008 | BLY1AP | Original Q7 | Legacy

7C Fertility drugs involve the use of . . .

1 FSH to stimulate eggs to mature.

2 LH to stimulate oestrogen production.

3 FSH to stimulate the release of eggs.

4 oestrogen to stimulate LH production.

7D IVF treatment usually involves giving a woman . . .

1 FSH only.

2 oestrogen only.

3 LH and oestrogen.

4 FSH and LH.

Turn over for the next question

4.5.3.4 Hormones in human reproduction

Question 06

June 2008 | BLY1H | Original Q6 | Legacy

6 (a) Describe the roles of FSH, oestrogen and LH in the menstrual cycle.

FSH .....

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Oestrogen .....

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LH .....

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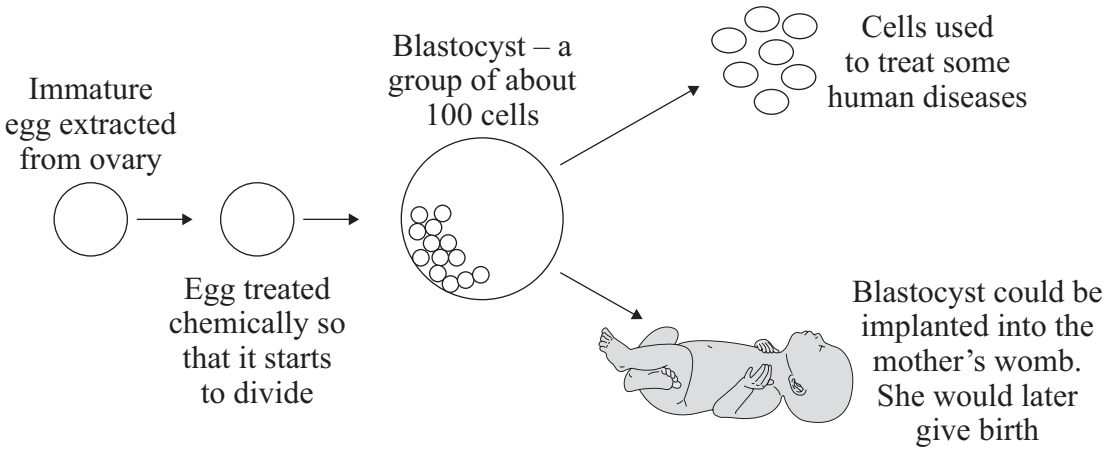
(4 marks)

4.5.3.4 Hormones in human reproduction

Question 06 · continued

for mark

6 (b) The diagram shows how an immature egg could be used either to produce cells to treat some human diseases or to produce a baby.



Scientists may be allowed to use this technique to produce cells to treat some human diseases, but not to produce babies.

Using information from the diagram, suggest an explanation for this.

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(4 marks)

8

4.5.3.4 Hormones in human reproduction

Question 07

November 2008 | BLY1AP | Original Q9 | Legacy

QUESTION NINE

This question is about hormones.

9A Which row in the table shows the sites of production of FSH, LH and oestrogen?

	FSH	LH	Oestrogen
1	pituitary gland	ovary	ovary
2	pituitary gland	ovary	pituitary gland
3	ovary	pituitary gland	pituitary gland
4	pituitary gland	pituitary gland	ovary

9B Which row in the table shows the effect of oestrogen on the production of FSH and LH?

	FSH production	LH production
1	stimulated	inhibited
2	inhibited	inhibited
3	stimulated	stimulated
4	inhibited	stimulated

9C IVF (in vitro fertilisation) treatment can be used to help childless couples have children.

This treatment usually involves giving the woman . . .

1 FSH only.

2 FSH and LH.

3 oestrogen and FSH.

4 oestrogen and LH.

4.5.3.4 Hormones in human reproduction

Question 07 · continued

9D Hormones are used during IVF treatment.

Which of the following is an ethical issue associated with IVF treatment?

1 Children born following IVF treatment will not have a father.

2 There may be more embryos produced than can be used.

3 The mother may produce many eggs during the treatment.

4 The mother will not be able to have more than one child.

END OF TEST

4.5.3.4 Hormones in human reproduction

Question 08

June 2009 | BLY1AP | Original Q8 | Legacy

QUESTION EIGHT

Women under the age of about 40 may take oral contraceptives containing oestrogen. However, there are possible side effects after long-term use of oestrogen.

8A The role of oestrogen in the menstrual cycle is to . . .

1 stimulate FSH production and inhibit LH production.

2 inhibit both FSH production and LH production.

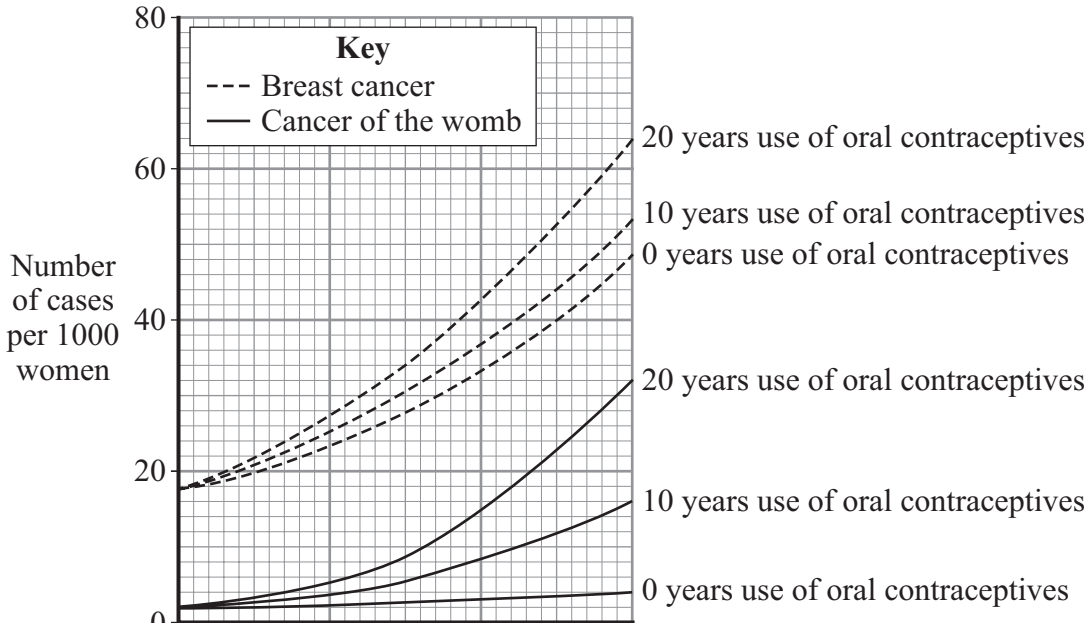
3 inhibit FSH production and stimulate LH production.

4 stimulate both FSH production and LH production.

8B Which row in the table correctly identifies the organs that produce the hormones controlling the menstrual cycle?

	FSH	LH	Oestrogen
1	pituitary gland	ovaries	pituitary gland
2	ovaries	pituitary gland	ovaries
3	pituitary gland	ovaries	ovaries
4	pituitary gland	pituitary gland	ovaries

The graph shows some of the effects of taking oestrogen as an oral contraceptive for different lengths of time between the ages of 16 and 40.



4.5.3.4 Hormones in human reproduction

Question 08 · continued June 2009 | BLY1AP | Original Q8 | Legacy

8C The graph shows that the use of oestrogen as an oral contraceptive for 20 years may . . .

1 cause an eightfold increase in the percentage of women who develop womb cancer by the age of 65.

2 cause a sixteenfold increase in the percentage of women who develop womb cancer by the age of 65.

3 have no effect on the risk of breast cancer until 54 years of age.

4 reduce the number of unwanted pregnancies.

8D Which one of the following statements **cannot** be deduced from the information in the graph?

1 Oestrogen in oral contraceptives causes cancer.

2 The longer a woman takes oral contraceptives, the greater the risk of certain cancers developing.

3 The older a woman is, the greater the risk of breast cancer developing.

4 Women who have never taken oral contraceptives are very unlikely to develop cancer of the womb.

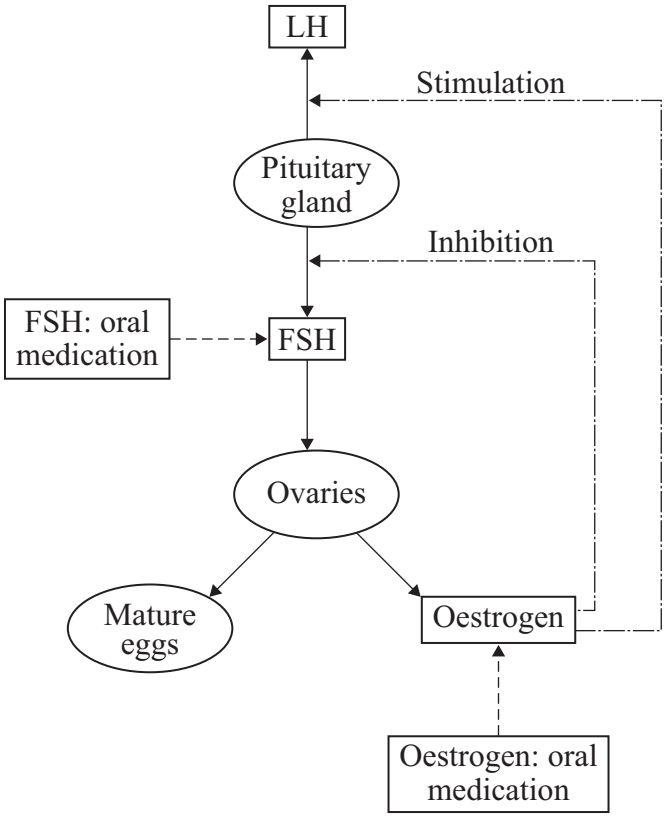
4.5.3.4 Hormones in human reproduction

Question 09

November 2009 | BLY1AP | Original Q9 | Legacy

QUESTION NINE

The diagram shows hormones involved in the control of the menstrual cycle and fertility.



9A A woman takes pills containing oestrogen.

The effect of this will be to . . .

1 encourage the production of more oestrogen by the ovaries.

2 increase the likelihood of pregnancy by encouraging the production of LH.

3 inhibit FSH production and stimulate eggs to mature.

4 inhibit FSH production and so inhibit the maturation of eggs.

9B A woman takes pills containing FSH.

The effect of this will be to . . .

1 stimulate the maturation of eggs.

2 inhibit the maturation of eggs.

3 reduce oestrogen production.

4 reduce LH production.

9C To assist the release of several eggs, a woman should be treated with medication containing . . .

1 FSH only.

2 FSH and LH.

3 oestrogen only.

4 oestrogen and FSH.

9D Which one of the following is based on scientific rather than ethical considerations in relation to IVF procedures?

1 Unused but fertile eggs should be destroyed.

2 The number of eggs collected should give the best chance of success.

3 The sex of the embryo which is to be implanted should be chosen by parents.

4 Single mothers should be offered IVF treatment.

END OF TEST

4.5.3.4 Hormones in human reproduction

Question 10

June 2010 | BLY1AP | Original Q1 | Legacy

QUESTION ONE

The menstrual cycle is controlled by hormones.

Match words, **A**, **B**, **C** and **D**, with the statements **1–4** in the table.

A embryo

B ovary

C pituitary gland

D womb

	Information
1	produces eggs
2	produced when a fertilised egg divides
3	produces the hormone FSH
4	its lining is thickened by the action of a hormone

4.5.3.4 Hormones in human reproduction

Question 11

November 2010 | BLY1AP | Original Q8 | Legacy

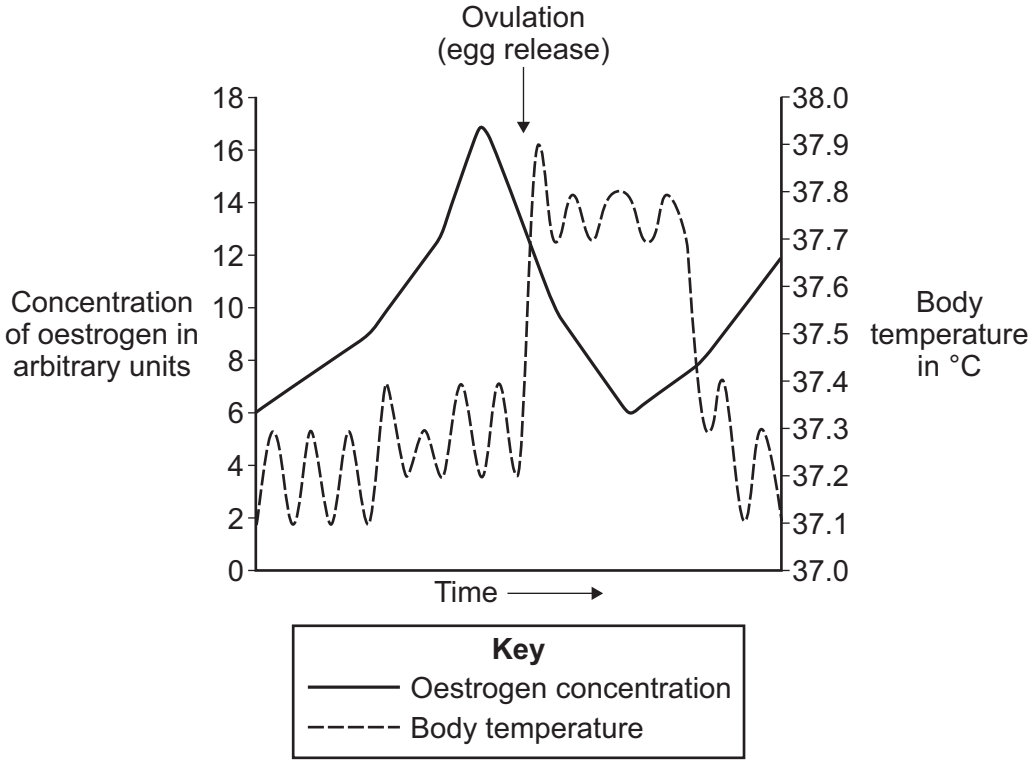
QUESTION EIGHT

Hormones control the menstrual cycle.

8A Which row in the table shows where oestrogen and FSH are produced?

	Oestrogen	FSH
1	ovaries	ovaries
2	pituitary gland	pituitary gland
3	ovaries	pituitary gland
4	pituitary gland	ovaries

The graph shows the changes in the concentration of oestrogen in a woman's blood during part of the menstrual cycle. The graph also shows the changes in her body temperature.



4.5.3.4 Hormones in human reproduction

Question 11 · continued

8B By how much does the woman's temperature rise (in °C) when the egg is released?

1 0.55

2 0.60

3 0.65

4 0.70

8C What is the relationship between the woman's body temperature and the concentration of oestrogen in her blood?

1 A rise in oestrogen concentration causes a rise in temperature.

2 Low oestrogen concentration is linked to high temperatures.

3 There is a link between a fall in oestrogen concentration and a rise in temperature.

4 A high temperature causes a rise in oestrogen concentration.

8D The rise in oestrogen before ovulation will . . .

1 inhibit FSH production and stimulate LH production.

2 stimulate FSH production and inhibit LH production.

3 inhibit FSH production and inhibit LH production.

4 stimulate FSH production and stimulate LH production.

4.5.3.4 Hormones in human reproduction

Question 12

March 2011 | BLY1AP | Original Q1 | Legacy

QUESTION ONE

We control conditions inside our bodies.

Match organs, **A**, **B**, **C** and **D**, with the statements **1**–**4** in the table.

A liver

B pituitary gland

C kidney

D skin

1	produces the hormone FSH
2	gets rid of excess heat
3	removes excess water from the blood
4	produces cholesterol

4.5.3.4 Hormones in human reproduction

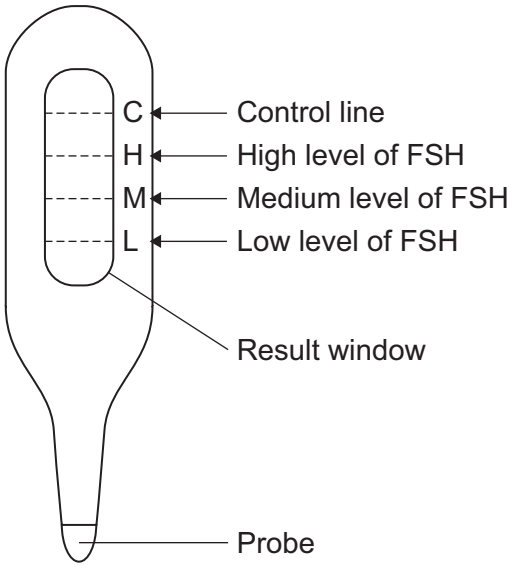
Question 13

March 2011 | BLY1AP | Original Q2 | Legacy

QUESTION TWO

Diagram 1 shows an instrument used to test FSH concentration in urine.

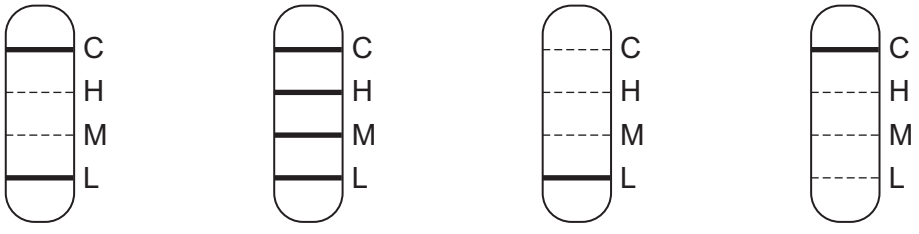
Diagram 1



The probe is put in a urine sample. After 30 minutes, dark lines may show in the result window. The control line shows when the test has been done correctly.

Diagram 2 shows the result windows of four tests, **A**, **B**, **C** and **D**.

Diagram 2



Match results, **A**, **B**, **C** and **D**, with the statements **1**–**4** in the table.

1	shows that the test was not done properly
2	shows the FSH level between the end of menstruation and egg release
3	shows a test on urine from a male
4	shows the FSH level at the end of the menstrual cycle

4.5.3.4 Hormones in human reproduction

Question 14

March 2011 | BLY1AP | Original Q9 | Legacy

QUESTION NINE

There are several ways of helping infertile women to become pregnant.

These include:

- IVF (in vitro fertilisation)
- FET – implanting frozen embryos from previous IVF treatments into the womb
- COH/IUI – treating the woman with 'fertility drugs' to release several eggs, then introducing sperm into the womb.

9A What is the main difference between COH/IUI and IVF?

1 Fertilisation takes place inside the woman in COH/IUI.

2 'Fertility drugs' are not used in IVF.

3 Sperm are not used in IVF.

4 Embryos are not formed in COH/IUI.

9B Which hormones are normally used as 'fertility drugs'?

1 FSH only

2 FSH and oestrogen

3 FSH and LH

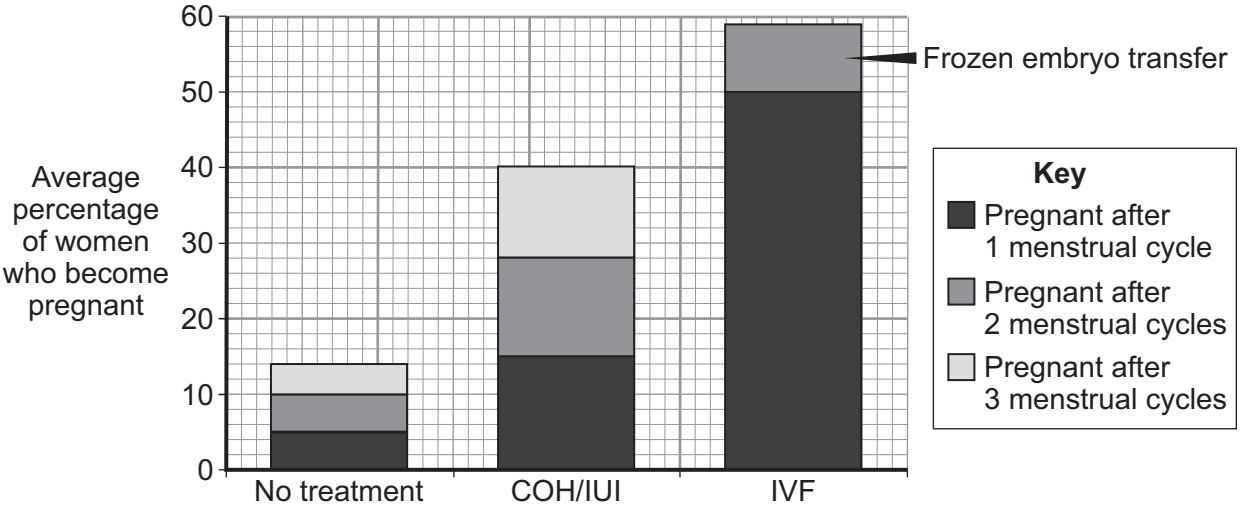
4 LH and oestrogen

4.5.3.4 Hormones in human reproduction

Question 14 · continued

March 2011 | BLY1AP | Original Q9 | Legacy

The graph shows the average percentage of women who become pregnant after one, two and three menstrual cycles.



9C IVF treatment increases the chance of getting pregnant after one menstrual cycle.

By how much does IVF treatment increase the chance?

1 4 times

2 5 times

3 10 times

4 60 times

9D What is the most likely reason for the higher success rate of IVF over COH/IUI?

1 More 'fertility drugs' are used in IVF.

2 Doctors can select the best embryos to use.

3 More eggs are produced in IVF.

4 Doctors can examine the sperm before they are used.

END OF TEST

4.5.3.4 Hormones in human reproduction

Question 15

June 2011 | BLY1AP | Original Q1 | Legacy

QUESTION ONE

This question is about human organs.

Match organs, **A**, **B**, **C** and **D**, with the functions **1**–**4** in the table.

A kidney

B liver

C ovary

D pituitary gland

	Function
1	produces cholesterol
2	produces FSH
3	produces oestrogen
4	produces urine

4.5.3.4 Hormones in human reproduction

Question 16

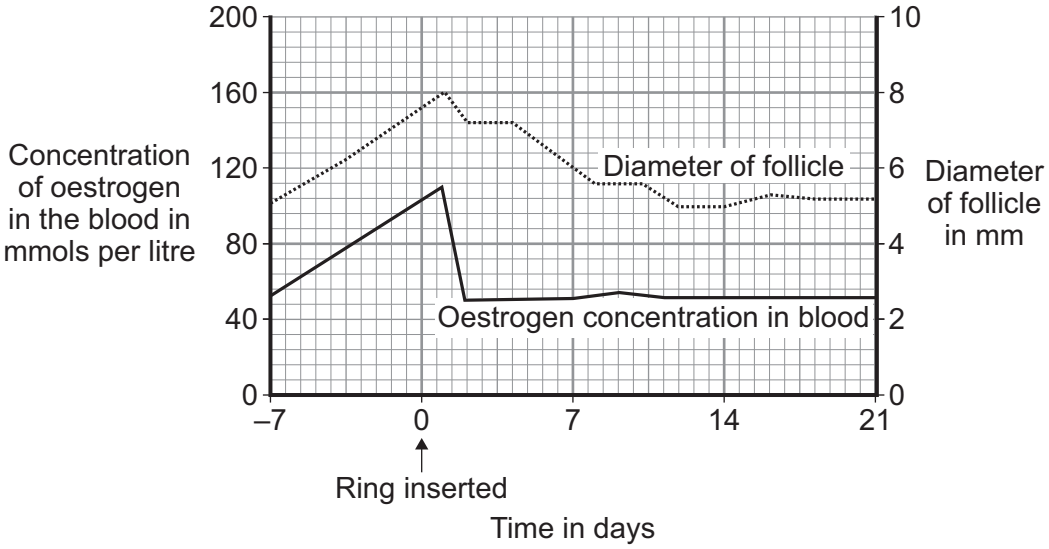
June 2011 | BLY1AP | Original Q9 | Legacy

QUESTION NINE

The ring is a new method of contraception. The ring is inserted into the vagina and releases very low doses of contraceptive hormones for 3 weeks. The woman then removes the ring and inserts a new ring one week later.

A follicle is a spherical structure in the ovary. Inside a follicle, an egg matures. As the egg matures, the follicle enlarges. When the egg is mature, the follicle bursts and releases the egg.

The graph shows the effects of using the ring method.



9A In a normal menstrual cycle, . . .

1 FSH stimulates LH production.

2 FSH stimulates oestrogen production.

3 oestrogen stimulates FSH production.

4 oestrogen inhibits LH production.

9B Using information from the graph and your own knowledge, hormones from the ring most probably . . .

1 stimulate oestrogen production.

2 inhibit LH production.

3 inhibit FSH production.

4 stimulate the production of both FSH and LH.

4.5.3.4 Hormones in human reproduction

Question 16 · continued

9C The ring prevents a woman from becoming pregnant by . . .

1 preventing the sperm from entering the womb.

2 preventing the thickening of the womb lining.

3 preventing eggs from maturing.

4 destroying the follicles.

9D The ring has a lower failure rate than most contraceptive pills.

The most probable reason for this is that . . .

1 hormones are released from the ring at a fairly constant rate.

2 hormones from the ring enter the blood.

3 hormones from the ring affect the pituitary gland.

4 hormones from the ring affect the womb.

END OF TEST

4.5.3.4 Hormones in human reproduction

Question 17

June 2011 | BLY1H | Original Q8 | Legacy

8 Hormones can be used as contraceptives.

8 (a) Explain **one** way in which a hormone can prevent conception (pregnancy).

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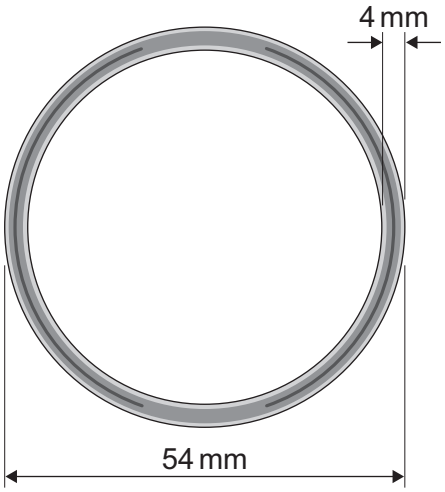
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(2 marks)

8 (b) Two methods of giving contraceptive hormones to a woman are the vaginal ring and the hormone implant.

Vaginal ring

The vaginal ring is a flexible ring 54 mm in diameter containing hormones.



The woman puts in and takes out the vaginal ring herself; there is no 'wrong' way to put the ring in.
Each ring is designed for one cycle of use, which is three weeks of continuous ring use, followed by one week without the ring.
About 0.3% of women become pregnant in the first year of ring use.
4% of women stop using the ring because of vaginal discomfort.

4.5.3.4 Hormones in human reproduction

Question 17 · continued

Hormone implant

A health professional puts the hormone implant under the skin of the woman's arm.
The implant releases contraceptive hormones for three years before the implant needs to be replaced.
The hormone implant is 100% effective.
About 2% of women stop using the hormone implant, mainly because of irregular menstrual bleeding.

Evaluate the use of the vaginal ring compared with the hormone implant.

Remember to give a conclusion to your evaluation.

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(4 marks)

6

4.5.3.4 Hormones in human reproduction

Question 18

January 2012 | BL1HP | Original Q4 | Legacy

4 The human body produces many hormones.

4 (a) (i) What is a *hormone*?

.....

.....

(1 mark)

4 (a) (ii) Name an organ that produces a hormone.

.....

(1 mark)

4 (a) (iii) How are hormones transported to their target organs?

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(1 mark)

4 (b) Describe how the hormones FSH, oestrogen and LH are involved in the control of the menstrual cycle.

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(3 marks)

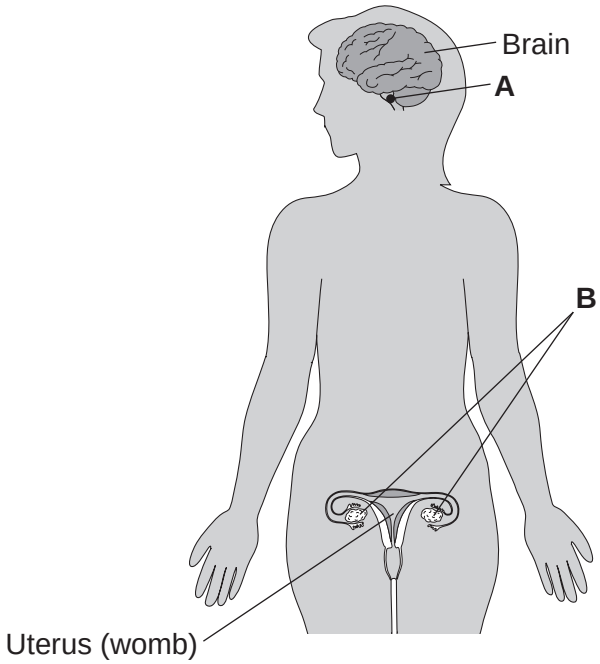
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4.5.3.4 Hormones in human reproduction

Question 19

January 2013 | BL1HP | Original Q2 | Legacy

2 The diagram shows the position of two glands, **A** and **B**, in a woman.



2 (a) (i) Name glands **A** and **B**.

A .....

B .....

(2 marks)

2 (a) (ii) Gland **A** produces the hormone Follicle Stimulating Hormone (FSH).

FSH controls changes in gland **B**.

How does FSH move from gland **A** to gland **B**?

.....

(1 mark)

Question 2 continues on the next page

4.5.3.4 Hormones in human reproduction

Question 19 · continued

2 (b) (i) A woman is not able to become pregnant. The woman does not produce mature eggs. The woman decides to have In Vitro Fertilisation (IVF) treatment.

Which **two** hormones will help the woman produce and release mature eggs?

Tick (✓) **one** box.

FSH and Luteinising Hormone (LH) ☐

FSH and oestrogen ☐

Luteinising Hormone (LH) and oestrogen ☐

(1 mark)

2 (b) (ii) Giving these hormones to the woman helps her to produce several mature eggs. Doctors collect the mature eggs from the woman in an operation.

Describe how the mature eggs are used in IVF treatment so that the woman may become pregnant.

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(3 marks)

2 (b) (iii) IVF clinics have been set a target to reduce multiple births.

> At least 76% of IVF treatments should result in single babies and a maximum of 24% of treatments should result in multiple births.

Suggest **one** reason why the clinics have been set this target to reduce multiple births.

.....

.....

(1 mark)

4.5.3.4 Hormones in human reproduction

Question 19 · continued

2 (c) Two clinics, **R** and **S**, used IVF treatment on women in 2007. Doctors at each clinic used the results of the treatments to predict the success rate of treatments in 2008.

The table shows the information.

	Total number of IVF treatments in 2007	Number of IVF treatments resulting in pregnancy in 2007	Predicted percentage success rate in 2008
Clinic **R**	1004	200	18 – 23
Clinic **S**	98	20	3 – 56

2 (c) (i) Compare the success rates of the two clinics in 2007.

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(1 mark)

2 (c) (ii) The range of the predicted success rate in 2008 for clinic **R** is much smaller than the range of the predicted success rate for clinic **S**.

Suggest why.

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(2 marks)

11

4.5.3.4 Hormones in human reproduction

Question 20

June 2015 | BL1HP | Original Q9 | Legacy

9 (a) A healthy diet should be balanced.

What is meant by a balanced diet?

[2 marks]

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9 (b) Cholesterol has important functions in the body.
Some cholesterol is produced by the liver.

Cholesterol is needed in the body to make the hormone oestrogen.

9 (b) (i) Name the organ in the body which produces oestrogen.

[1 mark]

.....

9 (b) (ii) What effect does oestrogen have on the female reproductive cycle?

[1 mark]

.....

.....

9 (b) (iii) Oestrogen is a naturally occurring steroid hormone.

Give **one** artificial use of a steroid hormone in the body.

[1 mark]

.....

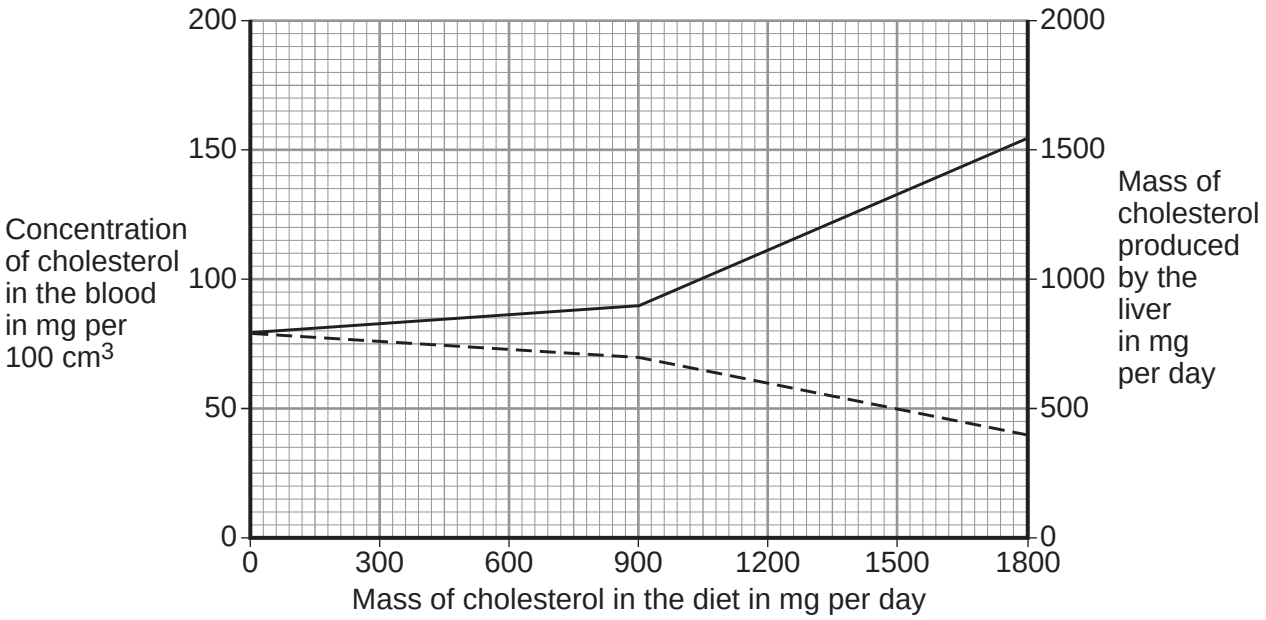
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Question 20 · continued

9 (c) **Figure 6** shows the effect of the mass of cholesterol in the diet on:

- the concentration of cholesterol in the blood
- the mass of cholesterol produced by the liver.

Figure 6



Key

——— Blood cholesterol concentration

– – – – Production by the liver

Describe the effect of increasing the mass of cholesterol in the diet on the mass of cholesterol produced by the liver.

To gain full marks you should include data from **Figure 6** in your answer.

[2 marks]

.....

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Question 9 continues on the next page

4.5.3.4 Hormones in human reproduction

Question 20 · continued

9 (d) Large amounts of cholesterol in the diet switch off the production of an enzyme called reductase, in the liver.

An increase of the enzyme reductase increases the production of cholesterol by the liver.

9 (d) (i) Which part of a liver cell is responsible for controlling the production of reductase?

[1 mark]

.....

.....

9 (d) (ii) High blood cholesterol concentrations increase the likelihood of heart and circulatory diseases.

Doctors can prescribe statins to control the concentration of cholesterol in the blood.

Suggest how statins work.

[1 mark]

.....

.....

9

4.5.3.4 Hormones in human reproduction

Question 21

November 2021 | 8461/2H | Original Q6

0 6 Reflex actions are coordinated by the nervous system.

0 6 . 1 What is meant by the term 'reflex action'?

[2 marks]

0 6 . 2 A woman's hand accidentally touches a hot object.

The woman moves her hand away rapidly.

Describe how the woman's nervous system coordinates the reflex action.

[6 marks]

4.5.3.4 Hormones in human reproduction

Question 21 · continued

0 6 . 3 The endocrine system coordinates many internal functions of the body.

Give **three** ways coordination by the endocrine system is different from coordination by the nervous system.

[3 marks]

1 _____

2 _____

3 _____

0 6 . 4 Describe how hormones control the menstrual cycle.

[5 marks]

16

4.5.3.4 Hormones in human reproduction

Question 22

June 2023 | 8461/2H | Original Q7

0 7 Hormones are important for regulating the menstrual cycle.

During the menstrual cycle, eggs mature inside follicles in the ovaries.

A 27-year-old woman was infertile.

A doctor tested a sample of the woman's blood.

The test did **not** detect any follicle stimulating hormone (FSH) in the woman's blood.

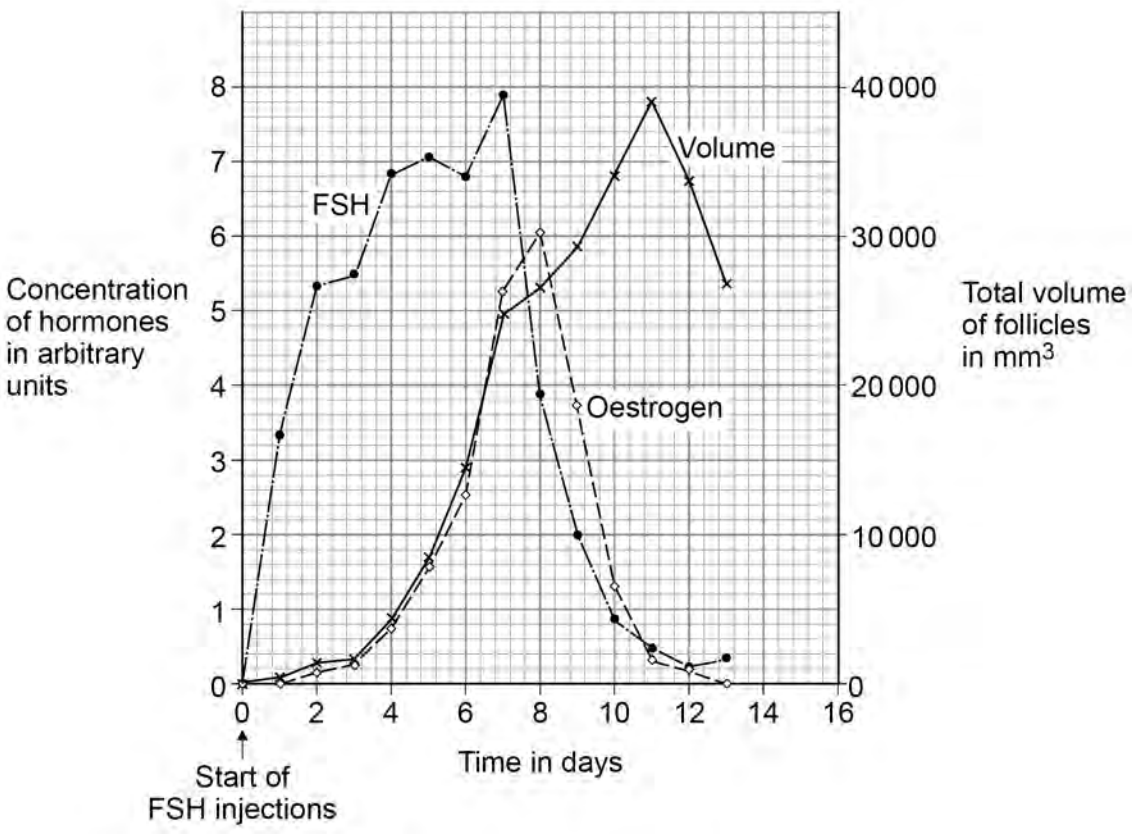
The doctor gave the woman daily injections of FSH for 7 days.

The doctor measured:

- the concentration of FSH in the woman's blood
- the concentration of oestrogen in the woman's blood
- the volumes of developing follicles in the ovaries.

Figure 12 shows the results.

Figure 12



4.5.3.4 Hormones in human reproduction

Question 22 · continued

0 7 . 1 Give evidence from **Figure 12** that the follicles in the ovaries release oestrogen.

[1 mark]

0 7 . 2 Injection of FSH caused the development of a number of follicles.

The mean diameter of the follicles on day 11 was 22 millimetres.

Calculate the number of follicles in the woman's ovaries on day 11.

Assume each follicle is a sphere.

Volume of a sphere = $\frac{4}{3}\pi r^3$

r = radius
π = 3.14

Give your answer to the nearest whole number.

[5 marks]

Number of follicles (to the nearest whole number) = _____

Question 7 continues on the next page

4.5.3.4 Hormones in human reproduction

Question 22 · continued

0 7 . 3 Before treatment with FSH, the woman had underdeveloped breasts.

Explain why the lack of FSH in the woman's blood caused underdeveloped breasts.

[2 marks]

0 7 . 4 Usually males and females both produce FSH.

The woman had inherited a faulty gene for FSH production from each of her parents.

The woman's parents both produce FSH.

Show how the **woman's parents** could have a child that does **not** produce FSH.

You should:

- draw a Punnett square diagram
- identify the phenotype of each offspring genotype
- use the symbols below:

  H = allele for making FSH

  h = allele for **not** making FSH

[3 marks]

4.5.3.4 Hormones in human reproduction

Question 22 · continued

0 7 . 5 The woman continues to have injections of FSH.

The woman has a child with a man who is heterozygous for the FSH gene.

Explain why the probability that the child will be able to produce FSH is 0.5.

[3 marks]

14

Turn over for the next question