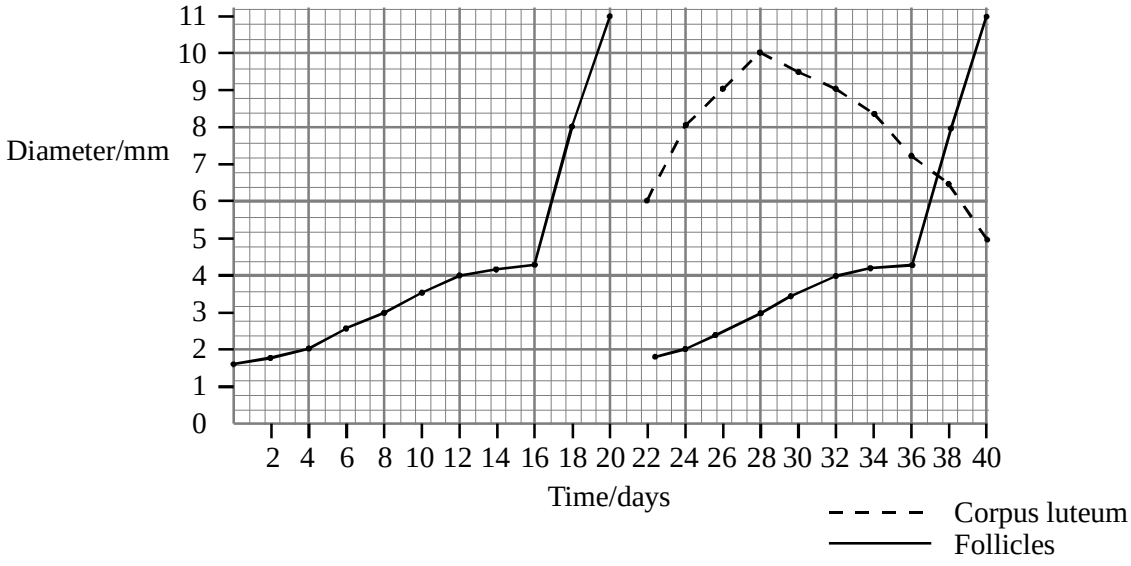
1. The graph shows the change in the diameter of developing ovarian follicles and a corpus luteum in a human ovary over 40 days.



(a) When would fertilisation be most likely to occur? Explain your answer.

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(2)

(b) Describe **two** pieces of evidence which show that fertilisation did not occur during the 40 days.

(i) .....

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(ii) .....

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(2)

(c) One type of infertility can be treated by using a drug called clomiphene. Clomiphene works by preventing the negative feedback of hormone X on FSH production.

(i) Name hormone X.

.....

(1)

(ii) Explain how excess hormone X can cause infertility.

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(1)

(Total 6 marks)

2. (a) Describe the role of hormones in controlling the development of the changes associated with puberty in girls.

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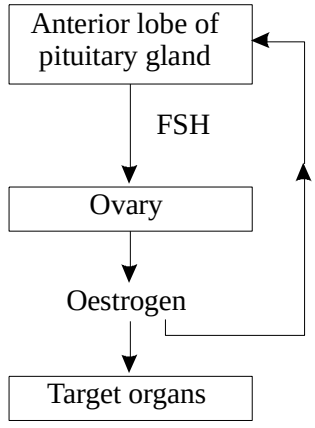
(6)

(b) The diagram shows the way in which hormones control the first part of the menstrual cycle.



(i) Some oral contraceptives contain oestrogen. Using information from the diagram, explain how these oral contraceptives function.

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(3)

(ii) The ovaries of women who have passed through the menopause no longer contain active follicles. The concentration of oestrogen and of FSH in the blood change after menopause. Use information from the diagram to explain why.

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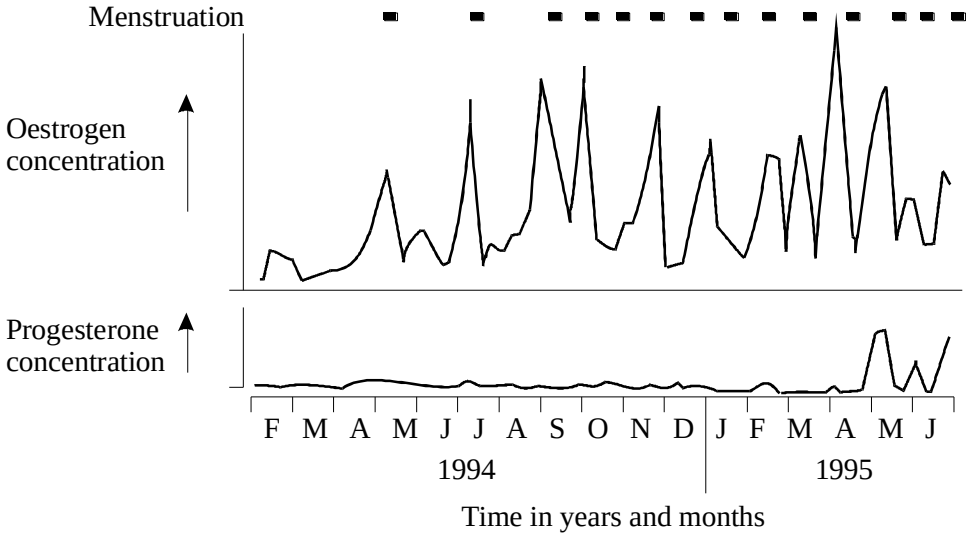
(3)
(Total 12 marks)

3. The graph shows changes in the concentration of oestrogen and progesterone in the blood of a girl going through puberty.



(a) The first ovulation usually takes place late in puberty. Suggest the advantage of this.

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(1)

(b) (i) In which year and month did this girl first ovulate?

.....year.....month

(1)

(ii) Explain the evidence from the graph that supports your answer to (c) (i).

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(2)
(Total 4 marks)

4. Mitochondria contain the genes needed for the synthesis of the enzymes involved in the electron transport chain. One of these enzymes is cytochrome oxidase. If a mutation occurs during replication of the mitochondrial genes, functional cytochrome oxidase may not be produced.

S Explain why mutation of a mitochondrial gene might result in no functional cytochrome oxidase being produced.

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(Total 5 marks)