

The Menstrual Cycle

Mark Scheme



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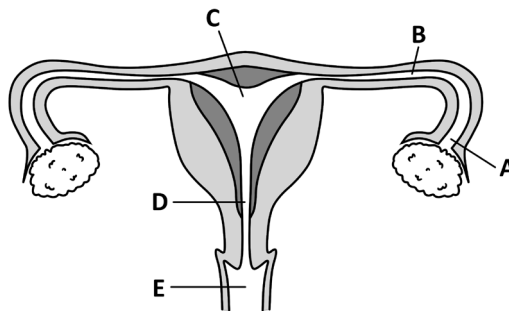
1. The menstrual cycle is the natural regular change that occurs in the reproductive system of a female that allows the uterus to support a pregnancy.

The figure below shows some of the hormonal changes which take place during the menstrual cycle.

If we assume that ovulation happens on day 14, in terms of hormones, what is happening just after ovulation?

D – is the only correct answer.	1 mark
	Total: 1 mark

- a) The figure below shows the female reproductive system.



At which location is an ovum released during ovulation?

A – is the only correct answer.	1 mark
	Total: 1 mark

- b) Which of the following hormones is primarily responsible for the thickening of the endometrium during the first half of the menstrual cycle?

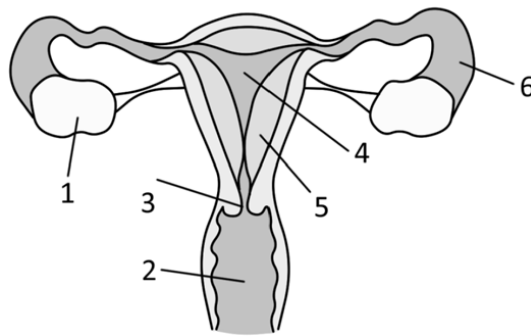
C – is the only correct answer.	1 mark
	Total: 1 mark

- c) Ovulation is triggered by a surge in the levels of which hormone?

A – is the only correct answer.	1 mark
	Total: 1 mark

(Total for Question 1 is 4 marks)

2. The figure below shows a section through the uterus of a human female.



a) Identify the structures labelled 1 to 6.

1 = Ovary/ Right ovary.	
2 = Vagina.	
3 = Cervix.	
4 = Uterus.	
5 = Endometrium. Accept; lining of the Uterus.	
6 = Fallopian tube/ left fallopian tube.	
Award 1 mark for each <u>correct pair</u> of labels.	
	Total: 3 marks

b) Name **two** hormones produced by the pituitary gland that play a significant role in the menstrual cycle.

FSH / Follicle Stimulating Hormone.	1 mark
LH / Luteinizing Hormone.	1 mark
	Total: 2 marks

The female contraceptive pill contains hormones to prevent pregnancy.

c) Explain how the hormones in contraceptive pills prevent ovulation.

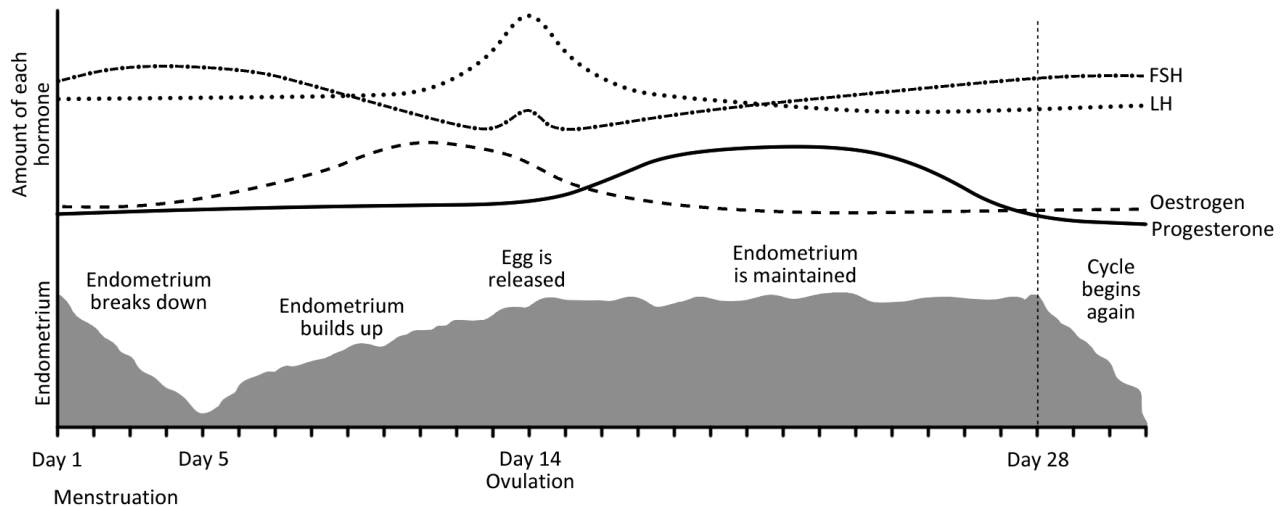
An explanation to include the following:	
(Pills contain) oestrogen (and/or progesterone) / synthetic versions of these hormones.	1 mark
(These hormones) inhibit the production / release of FSH (from the pituitary gland).	1 mark
Allow: stops FSH being released.	
(And/or these hormones) inhibit the production / release of LH (from the pituitary gland), (which) prevents the LH surge / prevents ovulation.	1 mark
Allow: stops LH being released.	
	Total: 3 marks

d) Explain how barrier contraceptives prevent pregnancy.

An explanation to include the following:	
They provide a physical barrier.	1 mark
(Which) prevents sperm from entering the uterus / reaching the egg / fertilisation.	1 mark
	Total: 2 marks

(Total for Question 2 is 10 marks)

3. The figure below shows the hormones of the menstrual cycle.



a) Explain how two of the hormones shown in the figure above cause ovulation.

Any two hormones explained, for 2 marks each. Max 4 marks.	
FSH (Follicle Stimulating Hormone): Note: FSH is less directly involved in CAUSING ovulation compared to LH and Oestrogen's role in the LH surge, but it is essential for follicle development which leads to ovulation. If a student chooses FSH, the points should reflect this. - FSH stimulates the development / maturation of the egg follicle (in the ovary). - allow causes an egg to mature in the ovary. - A mature follicle (which then produces oestrogen / is ready for LH action) is necessary for ovulation to occur / for the egg to be released.	
Oestrogen: - Rising levels of oestrogen (from the developing follicle) stimulate / trigger the release of LH (from the pituitary gland). - This is shown in the graph by oestrogen peaking just before the LH surge / around day 12-13, which then leads to ovulation around day 14. Allow: reference to positive feedback of oestrogen on LH secretion.	
LH (Luteinizing Hormone): - LH / Luteinizing Hormone causes / triggers ovulation / the release of the egg (from the follicle/ovary). - This is due to a surge / rapid increase / peak in LH levels (as shown in the graph around day 13/14, just before "Egg is released").	
Total: 4 marks	

b) Describe the role of oestrogen in the menstrual cycle.

An explanation to include the following:	
Stimulates the repair / thickening / build-up of the uterus lining / endometrium (after menstruation).	1 mark
At high levels / mid-cycle stimulates / triggers the release of LH (from the pituitary gland).	1 mark
Total: 2 marks	

c) State where oestrogen is produced in the body?

The Ovaries.	1 mark
	Total: 1 mark

d) Explain the function of progesterone after ovulation.

An explanation to include the following:	
Maintains the uterus lining / endometrium (in a thick / spongy / glandular state / rich in blood vessels).	1 mark
Inhibits the release / production of FSH and LH (from the pituitary gland.	1 mark
Allow: stops FSH/LH production.	
	Total: 2 marks

e) Explain how the levels of each hormone from the figure above would be different in a pregnancy.

Award one mark for each correct point explaining the difference for up to 4 hormones, or a combination of points. Reference to the graph is expected where appropriate.	
Progesterone levels would remain high / would not fall (as seen towards the end of the cycle in the graph).	1 mark
(High progesterone) maintains the uterus lining / endometrium (preventing menstruation).	1 mark
Oestrogen levels would also remain high / continue to rise (and not fall as much as shown at the end of the cycle in the graph).	1 mark
FSH levels would remain low / be suppressed (throughout pregnancy).	1 mark
LH levels would remain low / be suppressed / no LH surge would occur (after initial implantation period).	1 mark
	Total: 4 marks

(Total for Question 3 is 13 marks)