**LIFE SCIENCES: CONSOLIDATION TASK 13**

**GREEN – BASIC KNOWLEDGE**

**BLUE - UNDERSTANDING**

**RED - HIGHER ORDER**

**TOPIC: MENSTRUAL CYCLE**

**Activity 1[[1]](#footnote-1)**

**Menstrual cycle**

The series of diagrams below shows the events occurring in the ovary (ovarian cycle) and uterus (uterine cycle) during the menstrual cycle. The days are not exact, but are averages.

Use the following diagrams and information to complete a summary of the events occurring in the menstrual cycle in your NOTE BOOK. **Start at Day 1.**



**Day 1 to 7**

**Ovaries:**

**Uterus:**

**Day 15to 22**

**Ovaries:**

**Uterus:**

**Day 8 to 13**

**Ovaries:**

**Uterus:**

**Day 14**

**Ovaries:**

**Day 23 to 28**

**Ovaries:**

**No fertilization:**

**Fertilization:**

**Activity 2**

The ovarian cycle is the changes to **the ovary**, which lead to the release of **an ovum** at **ovulation**. The uterine cycle is the changes in the **endometrium**, which leads to the **implantation of an early embryo**. Both cycles are controlled by the **changes in the levels** of the **female sex hormones**.

Study the graphs and drawings (2.1) below and use the information to complete the table (2.2) in your NOTE BOOK.

Graph 2.1



We can also summaries the processes in the table below (2.2): Complete the table below in your NOTE BOOK.

|  |  |  |  |
| --- | --- | --- | --- |
| **Days**  | **Ovarian cycle** | **Hormonal changes** | **Uterine cycle** |
|  | Follicle development starts |  |  |
| 7 – 16 | Follicle continues to develop |  | New endometrium starts to grow |
| 17 – 22 |  |  | Surface of endometrium becomes receptive |
| 22 - 28 |  | Progesterone level dropsCorpus luteum also releases oestrogen |  |

2.3 The same information with new set of questions.



2.3.1 On which day does ovulation take place? (1)

2.3.2 Between which days does menstruation take place? (1)

2.3.3 State ONE function of FSH during the menstrual cycle. (1)

2.3.4 Describe the functional relationship between progesterone and FSH. (2)

2.3.5 Account for the change in the thickness of the endometrial lining between

day 14 and day 21. (3)

2.3.6 Did fertilisation take place within the 28-day cycle illustrated in the graph? (1)

2.3.7 Give reasons for your answer to QUESTION 2.3.6. (4)

QUESTION 3 and QUESTION 4 refer to the graph below which shows the menstrual cycle and the influence that different hormones have on it.



3 On which TWO days are the level of hormones X and Y the same?

A 12 and 13

B 14 and 21

C 15 and 26

D 7 and 27

4 Which of the following shows the pattern/trend of the level of hormones X and Z from days 13 to 14?

A X decreases and Z increases

B Both decrease

C X and Z are at their optimum level

D Both increase

Question 5

1. Describe the hormonal control of a menstrual cycle that does not end in

fertilisation.

Content: (17)

Synthesis: (3)

**Memorandum**

**Activity 1**



**Activity 2**

|  |  |  |  |
| --- | --- | --- | --- |
| **Days**  | **Ovarian cycle** | **Hormonal changes** | **Uterine cycle** |
| 0 – 6 | Follicle development starts | Follicle stimulating hormone (FSH) and Luteinising hormone (LH) start to increase from the anterior pituitary causing follicle growth and increasing oestrogen | Endometrial layer is shed as menstrual flow |
| 7 – 16 | Follicle continues to developAt day 14 follicle bursts releasing secondary oocyte | Oestrogen peaks at day 12, LH peaks at day 14 and ovulation occurs | New endometrium starts to grow |
| 17 – 22 | Secondary oocyte travels down the oviductCollapsed follicle becomes the corpus luteum | Oestrogen dropsCorpus luteum starts to release progesterone | Surface of endometrium becomes receptive |
| 22 - 28 | Corpus luteum starts to fade and disappear by day 28 | Progesterone level dropsCorpus luteum also releases oestrogen | Endometrium continues to thicken until corpus luteum stops producing progesterone |

QUESTION 2.3.

2.3.1 Day 14 √/15 (1)

2.3.2 Day 0–6 √ (1)

2.3.3 Stimulates follicle √ /ovum development in the ovary / secretion of

oestrogen (1)

2.3.4 An increase in progesterone level √ / inhibits the release of FSH √

OR

FSH stimulates the development of the ovum √ and progesterone prepares for implantation √ when this ovum is fertilised (2)

2.3.5 Corpus luteum √ starts to secrete progesterone √–which thickens √

the lining of the uterus wall / endometrium (3)

2.3.6 No √ (1)

2.3.7 Corpus luteum has degenerated √

Progesterone level has decreased √

FSH level starts to rise√

 LH level decreases √ (4)

3.1 C√√ (2)

3.2 B√√ (2)

QUESTION 4

The menstrual cycle is a series of events that occur in the female body to prepare it for possible pregnancy√ which involves ovarian cycle√ and the uterine cycle√

 It takes an average of 28 days √

The pituitary gland√ – secretes FSH √ which stimulates the development of a primary follicle√ in the ovary - The developing follicle √/Graafian follicle - secretes oestrogen √ which stimulates the thickening of the lining of the uterus √/endometrium –

 Around day 13 pituitary gland √ - secretes LH √ - which cause ovulation to occur √

The remains of the Graafian follicle develops into the corpus luteum √ which secretes the progesterone √ which continues to stimulate the thickening of the uterus √ - High levels of progesterone √ - inhibits the production of FSH √ so that the ovaries are no longer stimulated to produce another follicle √ If fertilisation does not occur √, the corpus luteum degenerates √ and stops producing progesterone √ - The pituitary gland √/hypophysis is no longer inhibited √ in its production of FSH √ and a new follicle develops √- The thick endometrium is no longer maintained √/ it degenerates and is shed together with blood/menstruation takes place √ Any 17

Content: 17

 Synthesis: (3)

 (20)

**ASSESSING THE PRESENTATION OF THE ESSAY**

|  |  |  |  |
| --- | --- | --- | --- |
| **Criterion** | **Relevance** | **Logical sequence** | **Comprehensive**  |
| Elaboration | All information provided is relevant to the topic | Ideas are arranged in a logical/cause-effect sequence | All aspects required by the essay have been addressed |
| Mark | 1 | 1 | 1 |
| Paper 2 | Only information relevant to the menstrual cycle or the role of hormones of the menstrual cycle is given. (There is no irrelevant information) | The events of the menstrual cycle are presented in the correct sequence and the hormones linked to the appropriate events | The role of all 4 hormones in the menstrual cycle are mentioned |
|  | √ | √ | √ |

1. Adapted from Mind the Gap, 2014 [↑](#footnote-ref-1)