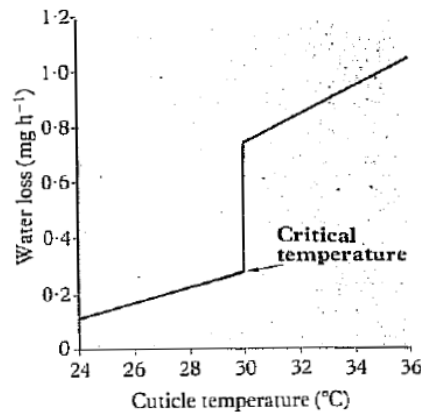


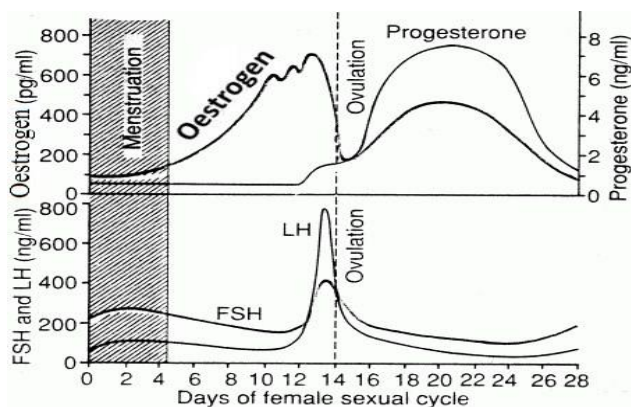
## KYEIZOoba GIRLS' SECONDARY SCHOOL

### S6 BIOLOGY HOLIDAY WORK

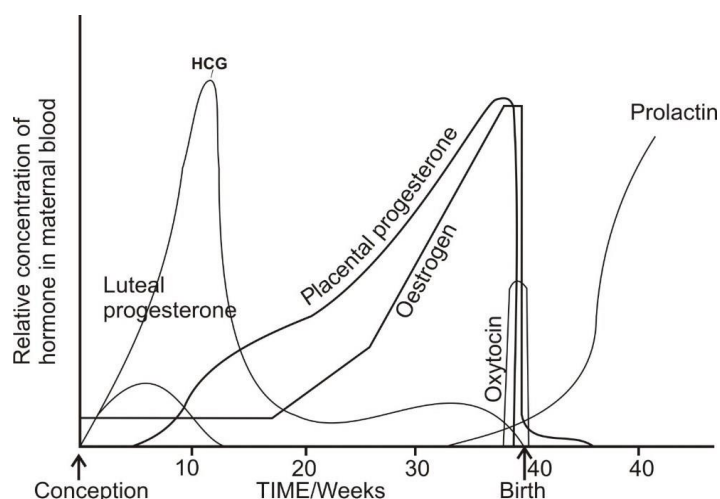
- Experiment was conducted to determine the effect of temperature on the permeability of the cuticle of the fresh Arthropod. This was done by gradually Warming a cockroach nymph and measuring the rate of water loss at different temperatures. The results are represented in the figure below.



- What is meant by the term critical temperature of the cuticle of Arthropod? Determine that temperature. **(06 marks)**
  - Explain the effect of cuticle temperature on its permeability to water. **(12 marks)**
  - Other than the above mentioned, discuss how terrestrial organisms overcome the challenge of water stress in their environment. **(22 marks)**
- The graph below shows the changes in the sex hormones and thickness of the uterine wall obtained by close observations made using blood samples that were withdrawn from an adult human female at regular intervals of days and by scanning the uterus respectively. The investigation was done for over a period of one month (28 days) immediately after the previous menstruation period.



- a) Describe the changes in the concentration of
    - (i) Oestrogen hormone. **(05 marks)**
    - (ii) Progesterone hormone. **(04 marks)**
  - b) Explain the different phases of the menstrual cycle **(10marks)**
  - c) Explain the relationship between oestrogen and progesterone concentration. **(10 marks)**
  - d) Explain what would happen if fertilization had occurred on the 21st day of the month. **(10 marks)**
3. The figure below shows the changes in the level of some reproductive hormones immediately after conception.



- a) Compare the levels of luteal and placental progesterone. **(04 marks)**
  - b) Explain the variation in the level of:
    - i) HCG (Human Chorionic Gonadotrophin) hormone **(06 marks)**
    - ii) Oestrogen hormone **(07 marks)**
  - c) What are the effects of the hormones oxytocin and prolactin towards the end of pregnancy? **(03 marks)**
4. While dogs form their tongues into spoons and scoop water into their mouths, scientists high-speed video have shown that cats use a different technique to drink aqueous like water and milk. Four times a second, the cat touches the tip of its tongue to the water draws a column of water up into its mouth, which then shuts before gravity can pull the back down. Describe how the properties of water allow cats to drink in this fashion, including how water's molecular structure contributes to the process. **(10**