



ACEITEKA JOINT MOCK EXAMINATIONS 2023
UGANDA ADVANCED CERTIFICATE OF EDUCATION
BIOLOGY PAPER 2
(Theory)
2 Hours 30 Minutes

Instructions to candidates:

This paper consists of Sections A and B

Answer question one in **Section A** plus three others from **Section B**

Candidates are advised to read the questions carefully, organize their answers and present them precisely and logically, illustrating with well labeled diagrams wherever necessary.

Section A (40 Marks)

- Figure 1 below shows changes in renal plasma ratio of individual solutes in different parts of the nephron. In figure 2, curve A shows changes in the concentration of solutes on administering Antidiuretic hormone (ADH) while curve B shows changes in concentration of the solutes in absence of ADH.

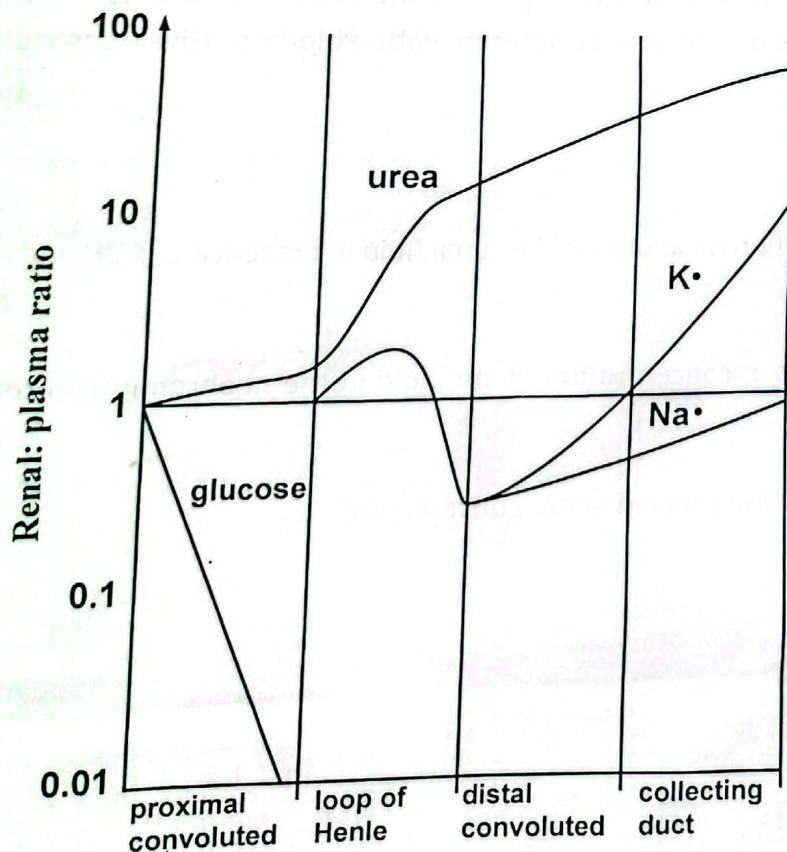
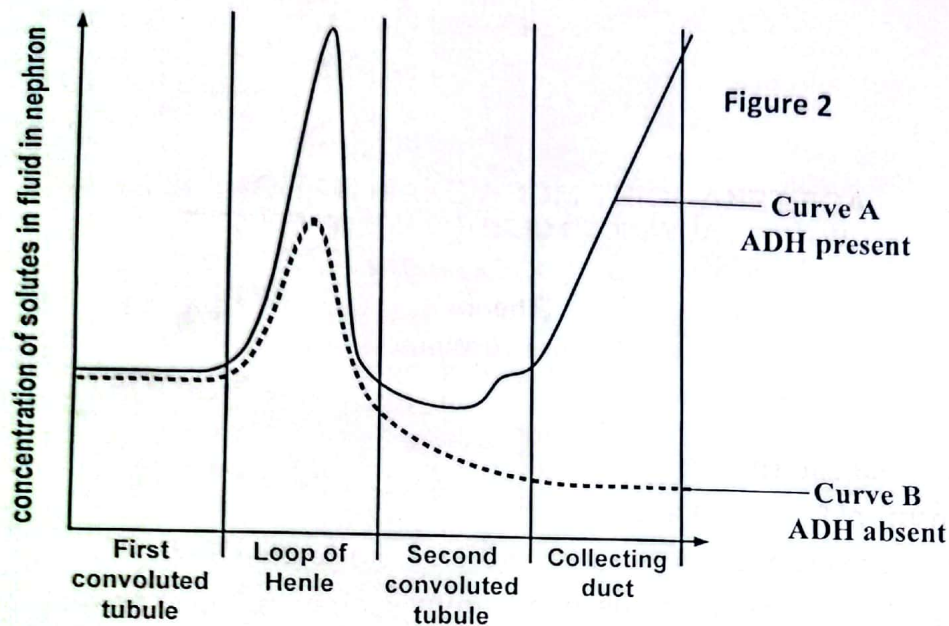


Figure 1



a) Describe the changes in the renal plasma ratio of each solute in different parts of the nephron (09 marks)

b) Explain the changes you have describe in a) above (10 marks)

c) Phlorizin is a chemical which makes the wall of the tubules impermeable to glucose. Predict how the renal plasma ratio would change for glucose within the proximal convoluted tubule and loop of Henle if the nephron was treated with Phlorizin. Give reasons for your answer. (04 marks)

d) Using Figure 2,

i) Compare the concentration of solutes in the renal fluid in presence of ADH and in absence of ADH. (06 marks)

ii) Explain the differences in concentration of the fluid in the nephron in different parts in presence of ADH and absence of ADH (07 marks)

iii) Explain the role of the vasa recta in water conservation (04 marks)

Section B (60 Marks)

2. a) Explain how Tilapia overcome their osmoregulatory challenges in a fresh water lake like Lake Victoria. (05marks)
- b) Describe elimination of nitrogenous wastes from the insect's body. (10marks)
3. a) Outline the adaptations of transfer cells. (05marks)
- b) Describe the mechanism of stomatal closure basing on proton ions' changes. (10marks)
- c) Mention three weaknesses and two evidences of the photosynthetic theory of stomatal movements. (05marks)
4. a) Describe the functioning of ecdysone hormone. (06 marks)
- b) Describe hormonal control of spermatogenesis in human testes. (10 marks)
- c) What is the role of the dartos muscles? (04 marks)
5. a) Describe the main summer season changes in a deep temperate lake. (10 marks)
- b) Compare oligotrophic and eutrophic lakes. (10 marks)
6. a) What is meant by the following terms?
- i) Polyploidy (03 marks)
- ii) Artificial selection (04 marks)
- b) Explain how polyploidy arises in sexually reproducing plants. (05 marks)
- c) Describe how polyploidy and artificial selection lead to formation of new species. (08 marks)