P530/2
BIOLOGY
(Theory)
PAPER 2
July/August
2½ hours

WAKISSHA JOINT MOCK EXAMINATIONS

Uganda Advanced Certificate of Education

BIOLOGY

(Theory)

Paper 2

2 hours 30 minutes

INSTRUCTIONS TO CANDIDATES:

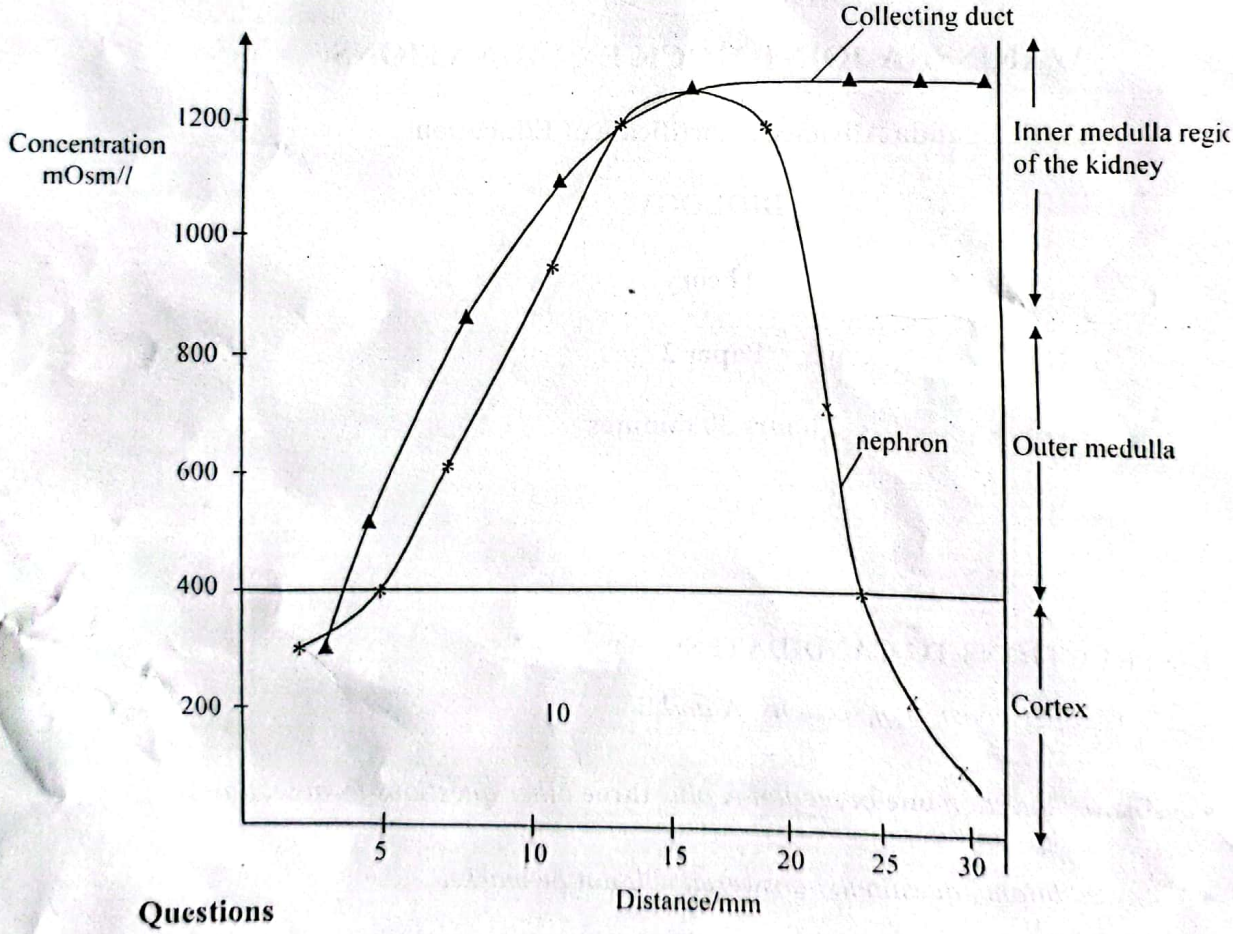
- *This paper consists of sections.* **A** *and* **B**.
- *Answer question* **one** *in section* **A** *plus* **three** *other questions from section* **B.**
- *Any additional question(s) answered will* **not** *be marked.*
- *Candidates are advised to read the questions carefully, organize their answers and present them precisely and logically.*
- *Illustrate with well labelled diagrams, wherever necessary.*

SECTION A (40 MARKS)

COMPULSORY QUESTION

1. Excretion of urea and other waste products is done by the nephron. The nephron transverses along the different regions of the kidney along which different substances like urea, water and salts i.e.(Na^+, Cl^- and K^+) are either added or removed depending on a variety of factors.

Fig 1.below: shows the variation of concentration within the glomerular filtrate along the nephron and the collecting duct. Study it carefully.



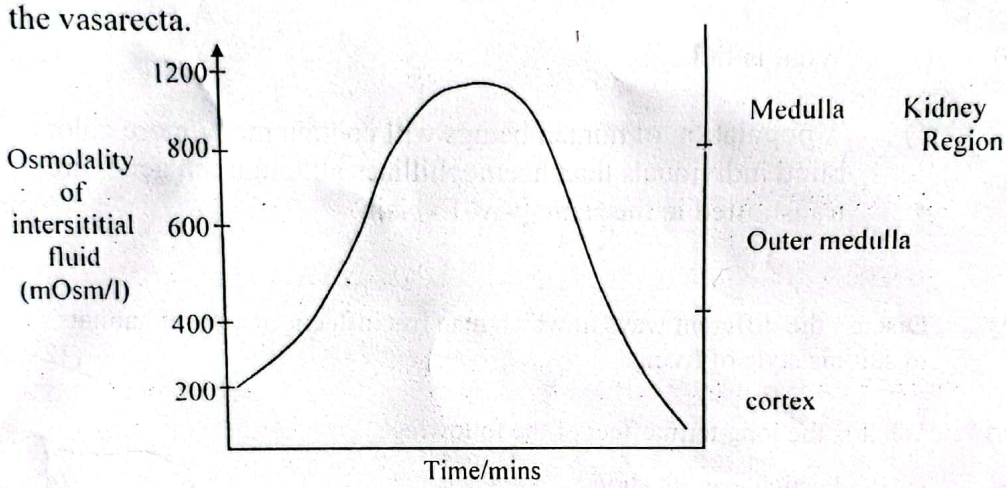
Questions

a) Describe the variation in concentration within the glomerular filtrate in the different regions of the kidney:
   (i) nephron (10 marks)
   (ii) collecting dust (6 marks)

b) Explain why the variation in concentrations within the glomerular filtrate in the different region of the kidney are as above in the;
   (i) nephron. (10 marks)
   (ii) collecting duct. (6 marks)

c) The vasarecta a blood vessel surrounding the nephron has both ascending and descending loops transversing the kidney.
The Osmolality of the interstitial fluid flowing per litre with in the vasarecta was measured at intervals.

Fig. 2 below, shows the Osmolality of interstitial fluid (mOsm/c) within the vasarecta.



(i) With reference to the curve for collecting duct fig. 1 and curve in fig. 2, state the similarities between the concentration in fluids flowing within the Vasa recta and the collecting duct. (3 marks)

(ii) Explain the observed similarities. (3 marks)

(iii) Mention any other function performed by the kidney apart from those discussed above. (2 marks)

SECTION B (60 MARKS)

*Answer **three** questions from this section.*

2. a) Write down the similarities and differences between angiosterms and gymnosperms. (8 marks)

b) i) Describe the life cycle of a virulent bacteriophage. (6 marks)

ii) List the importance of bacteria. (6 marks)

3. a) Describe the structure and function of the following tissues.

i) Areolar tissue. (8 marks)

ii) Striated muscle tissue. (8 marks)

b) How does the structure of proteins permit the wide variety of the functions of proteins? (4 marks)

4. a) What is meant by a receptor? (3 marks)

b) Describe the general features common to all receptors. (5 marks)

c) Using the mammalian ear as an example show how a receptor organ functions. (12 marks)

5. a) Describe the formation of vascular tissues in a herbaceous dicotyledonous stem. (12 marks)

b) i) What is linkage? (2 marks)

ii) A population of human beings will contain many more colour blind individuals than haemophilliacs although the genes are transmitted in the same way. Explain. (6 marks)

6. a) Discuss the different ways in which man has influenced natural habitats to suit his style of living. (12 marks)

b) What is the long term effect of the following?

i) Pesticide application. (4 marks)

ii) Global warming. (4 marks)

END