P530/2

BIOLOGY

PAPER 2

2½ hours

Apr 2023

Uganda Advanced Certificate of Education

BIOLOGY DEPARTMENT – 2023

SET TEN

PAPER 2

THEORY

2 hours 30 minutes.

INSTRUCTIONS TO CANDIDATES:

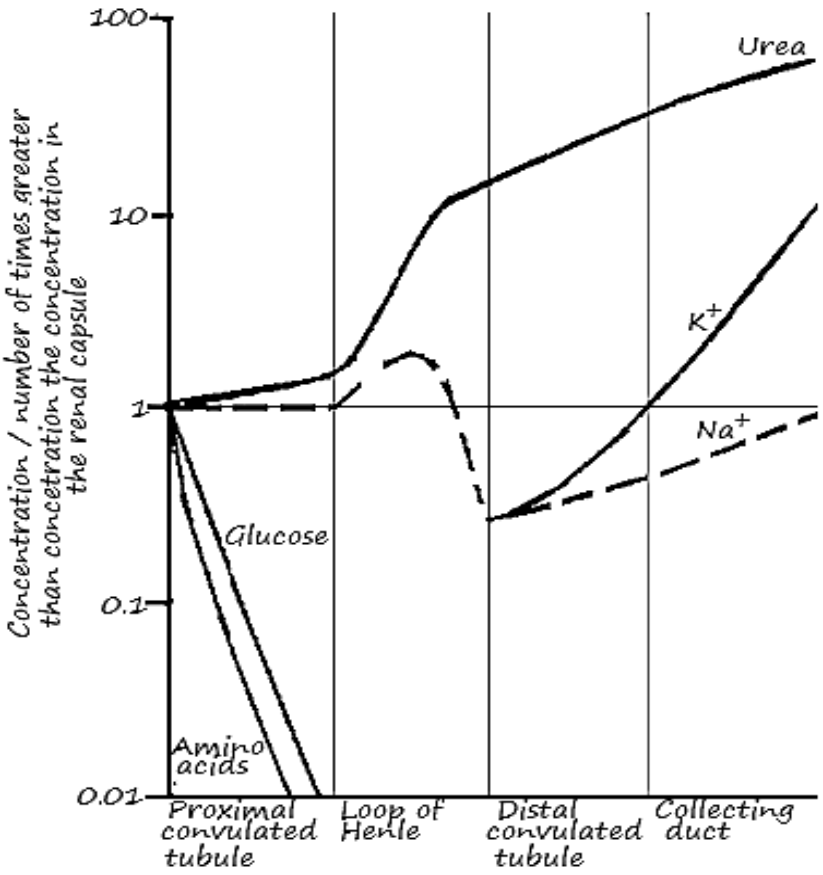
- ✓ Answer question one in section **A** plus three others from section **B**.
- ✓ Candidates are advised to read the questions carefully, organize their answers and present them precisely and logically, illustrating with well labeled diagrams where ever necessary.
- ✓ Write on the answer sheet, your name, index number and the questions attempted in their order as shown in the table.

QUESTION	MARKS
TOTAL	

SECTION A: (40 Marks)

Compulsory.

1. The graph below shows the relative concentrations of four substances as they pass along a kidney nephron of a mammal. Study it carefully to answer the questions below.



a) Describe the changes in the concentration of the substances as they pass along the kidney nephron. **(08marks)**

b) Account for the above changes in (a). **(12marks)**

c) Some mammals such as the vampire bat, feed on a protein-rich diet of blood sucked from other mammals. How is the large quantity of urea produced by these bat accounted for? **(06marks)**

d) Explain the counter current multiplier mechanism that occurs at the Loop of Henle. **(08marks)**

e) Describe the process of ultrafiltration in the glomerulus. **(08marks)**

f) State four roles played by the proximal convoluted tubule in kidney function. **(04marks)**

SECTION B: (60 Marks)

Attempt only 3 questions from this section.

2. (a) Explain the significance phosphate ions incorporated into plants. **(08marks)**
   (b) Outline the evidences for the role of xylem in translocation of mineral ions. **(07marks)**
   (c) Describe the methods exposed by insectivorous plants in obtaining essential elements from their nutrient deficient habitats. **(06marks)**
3. (a) Describe how a whole set of codons required for formation of a polypeptide are assembled from DNA? **(10marks)**
   (b) How are the codons assembled provide a basis for formation of the polypeptide **(10marks)**
4. (a) Describe briefly the range of defenses of a mammal against infection **(12marks)**
   (b) Explain the different modifications of the columnar epithelium to perform their roles in the body of animals. **(08marks)**
5. (a) Distinguish between the following as applied to evolution.
   (i) Convergent evolution and divergent evolution. **(05marks)**
   (ii) Analogous structures and homologous structures **(05marks)**
   (b) Account for the different pre-zygotic mechanisms that isolate organisms of different organism. **(10marks)**
6. (a) With suitable examples in each case, describe the photoperiodic categories of flowering plants. **(14marks)**
   (b) Outline the differences in the effects of red light and far-red light plants. **(06marks)**

END