BIOLOGY
(Theory)
PAPER 2
2½ hours

WAKISSHA

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.*

Turn Over

COMPULSORY QUESTION

The relationship between potassium ion concentration in the roots and sugar consumption at different oxygen concentration was investigated.

The table below shows the concentration of potassium ions ($mgcm^{-3}$) and the rate of sugar consumption ($mghr^{-1}$) by roots of a freshly uprooted plant when inserted in a bathing fluid at different oxygen concentration.

Oxygen concentration %	0	2	5	10	30	70
Potassium ion concentration/$mgcm^{-3}$	7	10	21	49	51	44
Rate of sugar consumption/ $mghr^{-1}$	14	16	20	27	34	36

Questions

a) Represent the above information graphically. (9 marks)

b) Compare the effect of oxygen concentration on potassium ion concentration
in the roots and rate of sugar consumption from the graph. (10 marks)

c) Explain the;
(i) presence of potassium ion concentration in the roots without Oxygen concentration. (4 marks)

(ii) relationship between potassium ion concentration and oxygen concentration. (6 marks)

(iii) increase in the rate of sugar consumption with oxygen concentration. (4 marks)

d) State two other factors than oxygen concentration that would affect the rate of potassium ion uptake by roots. (2 marks)

e) With an explanation, predict what would happen if the oxygen concentration was increased up to 98%. (5 marks)

SECTION B (60 MARKS)

Answer three questions from this section

2. a) Describe the structure and function of the cilia. (10 marks)

b) i) Compare the advantages and disadvantages of the electron microscope with the light microscope. (7 marks)

ii) Describe three different between plant palisade and animal smooth muscle cell as seen under the electron microscope. (3 marks)

3. a) With example, describe the variety and nature of bonds found in biological molecules. (12 marks)

b) In a large sexually reproducing population, a fatal disease can never wipe out the whole population. Discuss in agreement with the above statement. (8 marks)

4 a) What is a limiting factor in reference to photosynthesis? (3 marks)

b) Give an account of the role of each of the following in photosynthesis;

i) H_2O (5 marks)

ii) Light (4 marks)

c) How do plants living in shadows of tall plants able to obtain sufficient light photosynthesis. (8 marks)

5. a) i) Describe the composition and formation of lymph. (6½ marks)

ii) List three functions of lymph. (1½ marks)

b) Explain how various hormones interact to control blood pressure. (12 marks)

6. a) Describe how support in plants is achieved by the following;

i) Mechanical strengthening . (4 marks)

ii) Turgor pressure. (4 marks)

b) How is muscular movement effected in fish? (6 marks)

c) State the adaptations of fast moving animals to increase their speed. (6 marks)

END