P530/1

BIOLOGY

1½ hours

Jun/Jul 2023

Uganda Advanced Certificate of Education

BIOLOGY DEPARTMENT – 2023

SET ONE

Section B: PAPER 1

THEORY

1 hours 30 minutes.

INSTRUCTIONS TO CANDIDATES:

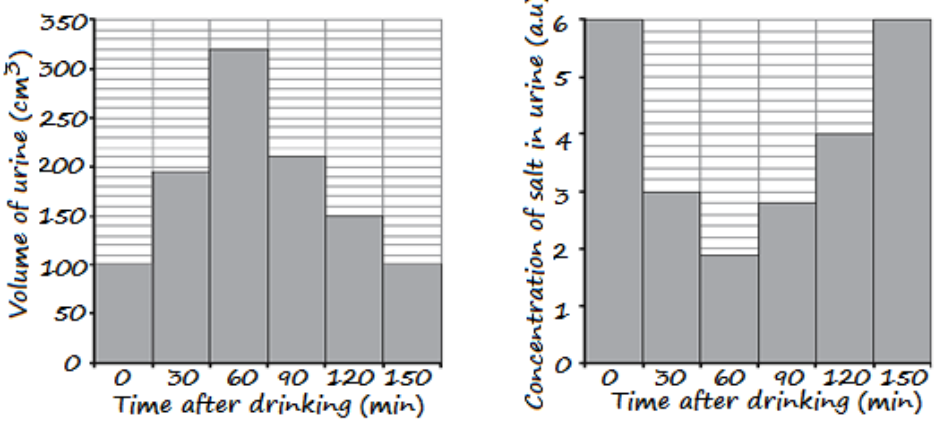
- ✓ Answer **all** questions in this paper (**paper is to be marked out of 60%**).
- ✓ You are advised to spend a maximum of **15 minutes** on each question.
- ✓ Candidates are advised to read the questions carefully, organize their answers and present them precisely and logically, illustrating with 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
Section A (1-40)	NIL
Section B	
41	
42	
43	
44	
45	
46	
TOTAL	

SECTION B: (60 Marks)

Each question carries 10 marks.

1. A student gave a sample of urine and then drank 1000 cm^3 of distilled water rapidly. Urine was then collected at regular intervals and measurements made of the volume of each sample and its salt concentration. The results are shown on the following graphs.



a) Explain the change in the

i. Volume of urine between 0 and 60 minutes. **(04marks)**

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ii. Change inn concentration of salt in the urine between 0 and 60 minutes. **(03marks)**

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b) State the relationship between volume of urine and concentration of urine between 60 and 150 minutes. **(01mark)**

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_____

c) Suggest reason(s) for the relationship in (b) above. **(02marks)**

2. There are nine subspecies of giraffe. These subspecies evolved when populations of giraffe were separated for long time periods. Each subspecies has distinct coloured skin markings. Some biologists have suggested that up to six of these subspecies should be classified as different species.

    a) Explain how different subspecies of giraffe may have evolved from a common ancestor. **(04marks)**

    b) Biologists compared the mitochondrial DNA of the different subspecies of giraffe. They used the results from comparing this DNA to conclude that six of the nine subspecies are separate species. Suggest how they came to this conclusion. **(02marks)**

    c) Even when the initial population was not separated, Biologist suspect that there would be chances of formation of subspecies over the time. Explain how these subspecies would arise? **(04marks)**

3. Herbicides work in a number of different ways.

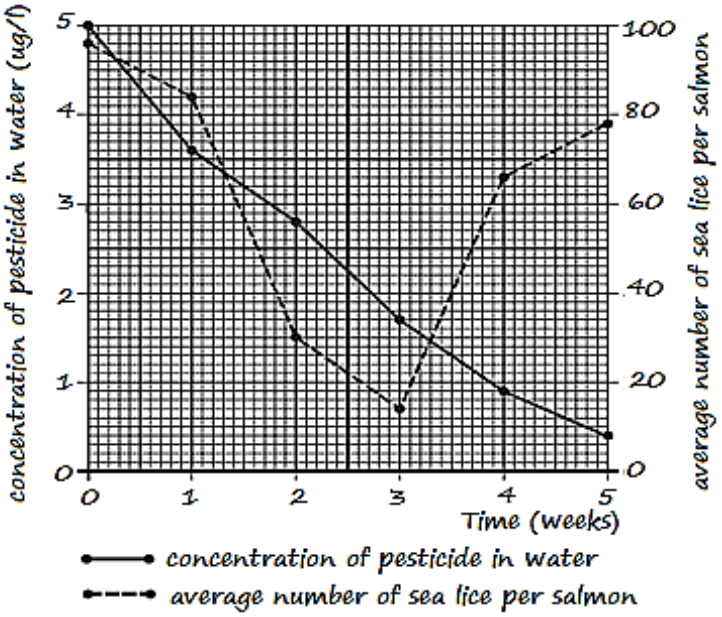
a) Some herbicides, known as phenoxy herbicides, mimic the action of the auxin, indoleacetic acid (IAA).
Explain the normal action of IAA in plant cells. **(05marks)**

b) The herbicide atrazine works by disabling plastoquinone, one of the proton pumps in photosystem II.
Explain how atrazine would kill a susceptible plant. **(05marks)**

4. (a) State the role of interphase in cell division. **(04marks)**

(b) Compare mitosis and meiosis. **(06marks)**

5. Farmed salmon are often infested with sea lice. The sea lice can be controlled by adding a pesticide to the water. The concentration of pesticide in the water and the average number of sea lice per salmon were monitored over a 5-week period.
The results are shown in the graph.



(a) Describe the changes in concentration in concentration of pesticide in water and the average number of sea lice per salmon. **(03marks)**

(b) Account the observed changes in the average number of sea lice per salmon for the five weeks. **(05marks)**

(c) Outline the side effect of excessive use of the pesticide in controlling sea lice. **(02marks)**

6. Describe how

(a) Potassium ion movements affect stomatal functioning in plants. **(06marks)**

(b) Ionic balance within a resting nerve is maintained. **(04marks)**