

**THE UNITED REPUBLIC OF TANZANIA
NATIONAL EXAMINATIONS COUNCIL
CERTIFICATE OF SECONDARY EDUCATION EXAMINATION**

033/2

**BIOLOGY 2
ALTERNATIVE TO PRACTICAL
(For Both School and Private Candidates)**

TIME: 2½ Hours

Wednesday morning 10/10/2007

Instructions

1. This paper consists of **five (5)** questions.
2. Answer **all** questions.
3. Each question carries 10 marks.
4. Except for diagrams which must be drawn in pencil all writings should be in blue/black ink or ball point pen.
5. Electronic calculators are **not** allowed in the examination room.
6. Cellular phones are **not** allowed in the examination room.
7. Write your **Examination Number** on every page of your answer booklet(s).

This paper consists of 5 printed pages.

1. In a practical lesson, a candidate has been provided with a sweet potato and a ginger.
- (a) Explain how the candidate should prepare these organs for investigation of stored foods and suggest the experiment(s) he/she would carry out and his/her observations.
- (b) Record the information as shown in the table below:

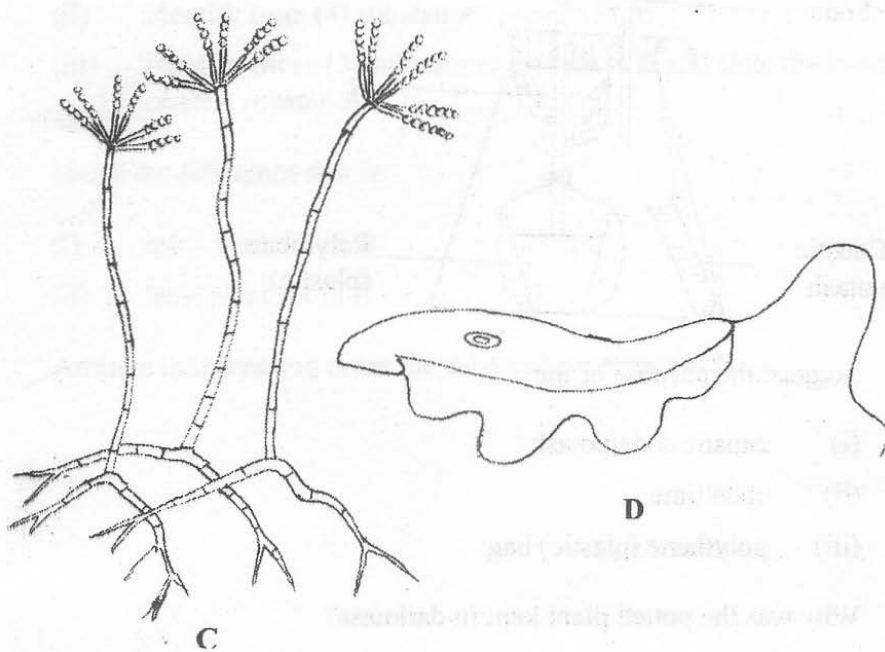
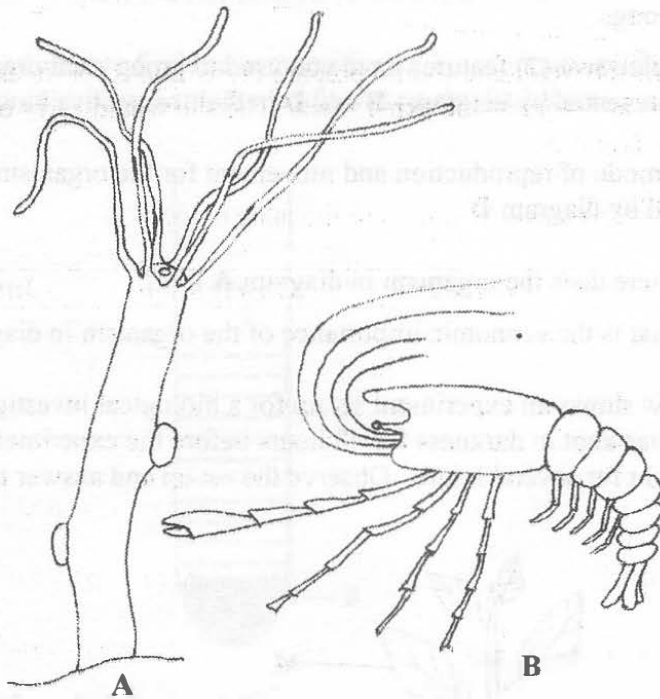
Test for	Procedure	Observation	Inference

- (c) (i) State the nature of the stored food substances identified in each storage organ.
(ii) Name the plant part from which each storage organ develops.
2. A class of twelve groups of students carried out a survey of uncultivated land measuring 20×15 metres; with twelve 5×5 m quadrats labelled A - L. Each group counted the number of black ants, grasshoppers, spiders and beetles in each quadrat as shown in the table below.

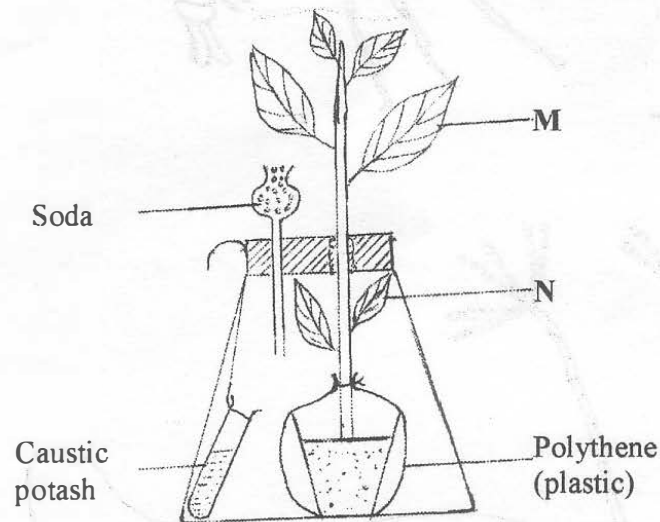
Animals	Number of animals in each quadrat											
	A	B	C	D	E	F	G	H	I	J	K	L
Black ants	30	25	6	7	20	26	10	4	27	11	30	20
Red ants	25	2	17	5	0	4	4	23	4	61	45	25
Grasshoppers	8	3	2	9	2	7	3	6	1	8	12	5
Spiders	1	1	2	1	1	1	2	6	1	3	12	4
Beetles	0	0	0	2	2	0	0	2	0	0	0	1

- (a) Calculate the
- (i) area of the land surveyed.
(ii) density of grasshopper population in the whole plot.
- (b) Which group of animals is most abundant/plentiful?
- (c) Calculate the density of the most abundant group of animals.
- (d) Give **three (3)** reasons to explain why the population density of the area studied will have changed after six months.

3. Carefully observe the organisms represented by diagrams A, B, C and D shown below:



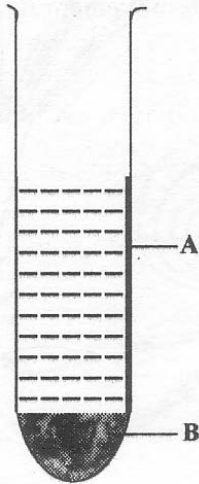
- (a) (i) Identify the organisms represented by diagrams **A**, **B**, **C** and **D** by their common names.
- (ii) Name the kingdom to which each of the organisms in (a) (i) above belongs.
- (iii) Which **two (2)** features have you used to group each organisms represented by diagrams **B** and **D** in their respective kingdom?
- (b) Name the mode of reproduction and movement for the organism represented by diagram **D**.
- (c) (i) Where does the organism in diagram **A** live?
- (ii) What is the economic importance of the organism in diagram **C**?
4. The diagram below shows an experiment set up for a biological investigation. The potted plant was kept in darkness for 48 hours before the experiment. It was then kept in sunlight for several hours. Observe the set up and answer the questions.



- (a) Suggest the purpose of the
- (i) caustic soda/potash.
- (ii) soda lime.
- (iii) polythene (plastic) bag.
- (b) Why was the potted plant kept in darkness?
- (c) (i) What will be observed if iodine solution is added to leaves **M** and **N** after their chlorophyll is removed?
- (ii) Which of the leaves **M** and **N** served as a control experiment?

- (d) (i) Name the biological process investigated in the experiment.
(ii) Suggest the aim of the experiment.
(iii) State the importance of the experiment.

5. In an experiment to find the composition of blood, 5 cm³ of fresh blood from a rabbit was centrifuged and the result was as shown below.



- (a) (i) Label **A** and **B**.
(ii) Identify **four (4)** substances present in **A**.
(iii) Identify **three (3)** substances present in **B** and state the function(s) of each substance.
- (b) Name the substance that is
(i) most plentiful in **B**.
(ii) least plentiful in **B**.
- (c) Arrange in increasing order the substances present in **B**.