

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

033/2

BIOLOGY PAPER 2

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

TIME: 2 ½ Hours

5 November 1999 A.M.

INSTRUCTIONS

1. Answer ALL questions.
2. All answers must be written in the answer booklet provided.
3. Except for diagrams, which must be drawn in pencil, all writing should be in blue/black ink or ball point pen.
4. Write your centre and index number on every page of your answer booklet.

NOTE: The mark allocation is indicated at the end of each question.

This paper consists of 6 printed pages.

1. A form two student who had just studied food test experiments and digestion of food in the mouth, prepared two solutions for investigation as follows:
He took a piece of raw cassava, cut it into small pieces and ground it using a mortar and pestle. He then added 30cm^3 of cold water, decanted the mixture into a beaker, and labelled the beaker "Cassava extract".

He collected about 5cm^3 of saliva in another beaker, added 5cm^3 of water, stirred the mixture, and labelled the beaker "Saliva solution".

He then performed the following experiments:-

Experiment 1

5cm^3 of the cassava extract was tested for the presence of carbohydrates.

Experiment 2

5cm^3 of saliva solution was added to 5cm^3 of cassava extract in a test tube. The mixture was left to stand for 5 minutes, and then it was tested for the presence of carbohydrates.

Experiment 3

5cm^3 of cassava extract was boiled for 5 minutes allowed to cool, and then tested for the presence of carbohydrates.

Experiment 4

5cm^3 of cassava extract was boiled for 5 minutes and allowed to cool. 3cm^3 of saliva solution was added and after 5 minutes the mixture was tested for the presence of carbohydrates.

1. (a) Present the student's experimental work for experiments 1 to 4 in a table form as shown below.

Experiment	Test for	Procedure	Observation	Inference
1				
2				
3				
4				

- (b) Suggest the aim of the student's experiment.
(c) Explain the difference in observations between experiments 2 and 4.

(10 marks)

2. The diagram below (Figure 1) represents an apparatus set up for a biological investigation. Study the set up and then answer the questions which follow.

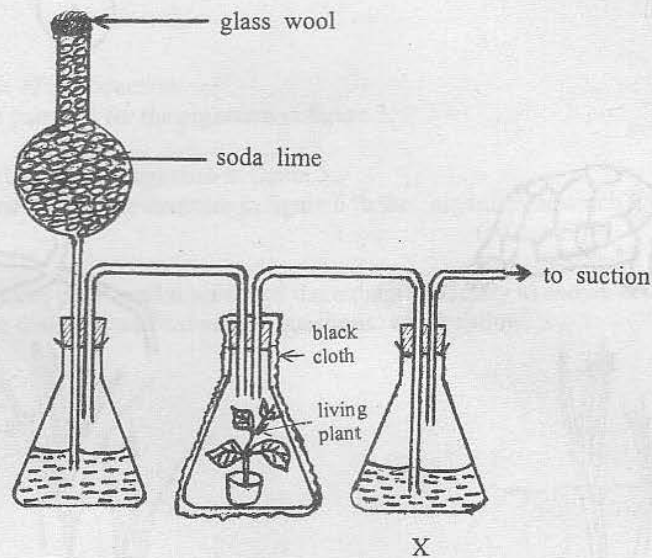


Fig. 1

- (a) (i) What biological process does the apparatus intend to demonstrate?
(ii) Suggest the aim of the experiment for the above apparatus set up.
(b) Give the name of the liquid in flask X.
(c) Why should the flask containing the plant be covered with black cloth?
(d) What is the purpose of soda lime?

(8 marks)

3. The diagrams below Figures 2 to 6, represent organisms and a part of an organism. Study them and then answer the questions which follow:-

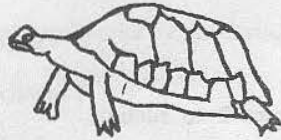


Fig. 2

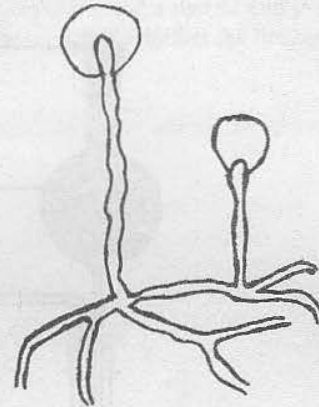


Fig. 3

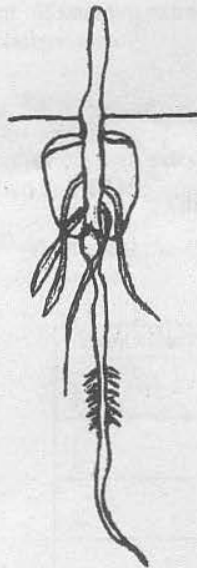


Fig. 4

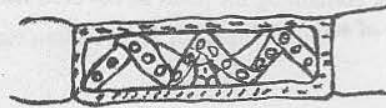


Fig. 5



Fig. 6

- (a) Identify the organisms and part of an organism using common names.
- (b) (i) Classify the organisms in figures 2, 3 and 5 to class level.
(ii) Give two distinguishing characteristics of each of the classes named in (b) (i) above.

- (c) Name
 - (i) the mode of reproduction
 - (ii) mode of nutrition for the organism in figure 3.

- (d) Name the habitat of the organism in figure 5.

- (e) Give two functions of the structure in figure 6 to the organism in which it is found.
(10 marks)

4. Asnati uprooted three plants and represented them diagrammatically as shown below (Figures 7, 8 and 9). Study the diagrams and answer the questions which follow.

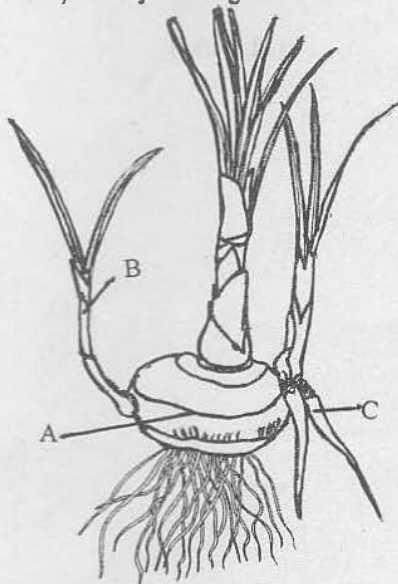


Fig. 7

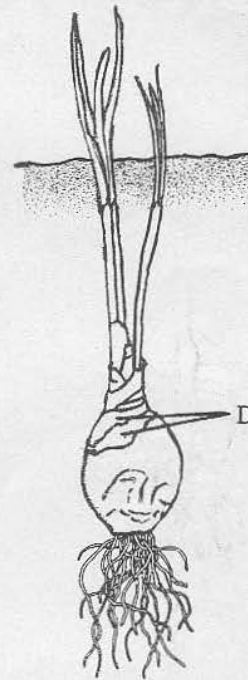


Fig. 8

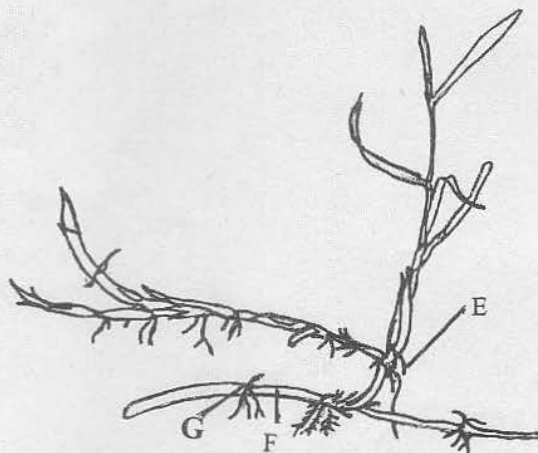


Fig. 9

- (a) Name the parts labelled A to G.
- (b) In which part of the plant does each of the plants store its food?
- (c) What names do we give to plants which store food like the plants in figures 7, 8 and 9?
- (d) Draw a large labelled diagram of a stem tuber.
5. (a) (i) Draw large well labelled diagrams of a spider and a grasshopper.
(ii) State the habitat of each of the two organisms.
- (b) (i) State the phylum and class for each of the two organisms.
(ii) Name five observable features present in the spider which distinguish the class to which it belongs from that of the grasshopper.
- (c) (i) Draw a large and well labelled diagram of the hind limb of the grasshopper.
(ii) Explain how this limb is adapted for the function it performs.

(12 marks)