

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

**033/2**

**BIOLOGY PAPER 2  
(ALTERNATIVE TO PRACTICAL)**

**25 January 1999 P.M.**

**TIME: 2½ hours**

**Instructions:**

1. Answer ALL questions.
2. All answers must be written in the answer book 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 book.

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

1. A substance X was mixed with an enzyme and incubated at  $37^{\circ}\text{C}$  for 10 minutes. The products were then boiled with dilute acid (e.g. HCl) then neutralized with NaOH solution until alkaline. It was boiled with Benedicts solution and heated. A red precipitate was formed.

- (a) What is X? Give reasons.
- (b) Outline the possible chemical changes that took place.
- (c) Why was the temperature kept at  $37^{\circ}\text{C}$ ?
- (d) What is the role of HCl in this experiment?
- (e) Why was neutralization necessary before the addition of Benedicts solution? (10 marks)

2. Two leafy shoots taken from different plant species A and B which occupy different habitats were each weighed and hung in an oven which was regulated to a temperature of  $50^{\circ}\text{C}$ . The shoots were reweighed at 20 minute intervals. The results were tabulated as shown below:

Time in minutes	Mass in gms of leafy shoot of species A	Mass in gms of leafy shoot of species B
0	100.0	100.0
20	70.0	89.1
40	40.0	80.0
60	24.0	78.0
80	19.50	74.0
100	19.0	72.0
120	19.0	71.0

- (i) Using graph paper, plot graphs of mass against time for species A and B using common axis.
- (ii) Calculate the percentage mass decrease of each after the end of the experiment.
- (iii) Explain the cause of mass change in the two leafy shoots.
- (iv) Which of the two plant species can survive in semi-arid regions? Give reasons to support your answer. (10 marks)



3. Figures 1 - 4 are mouth parts of different animals. In the table on the next page write the modification of each mouth and the feeding habits shown by each as shown by the example of figure 0015.

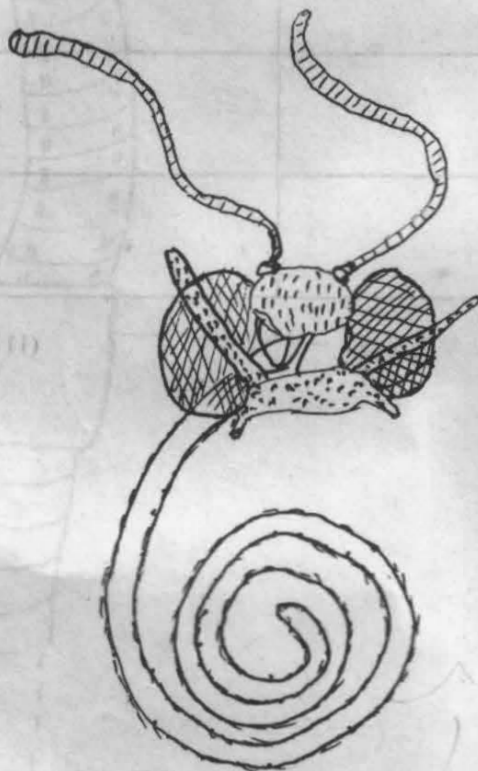
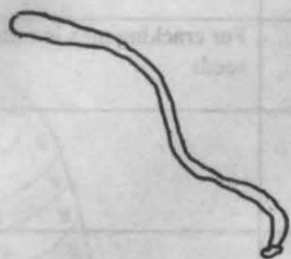


FIG. 1

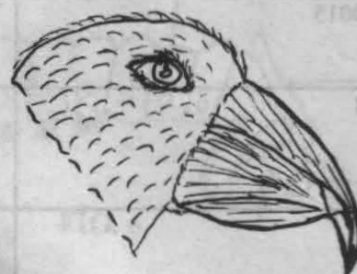


FIG. 2

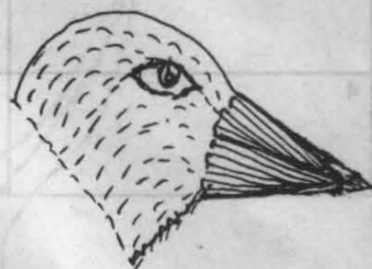


FIG. 3



Fig. 0015

Example

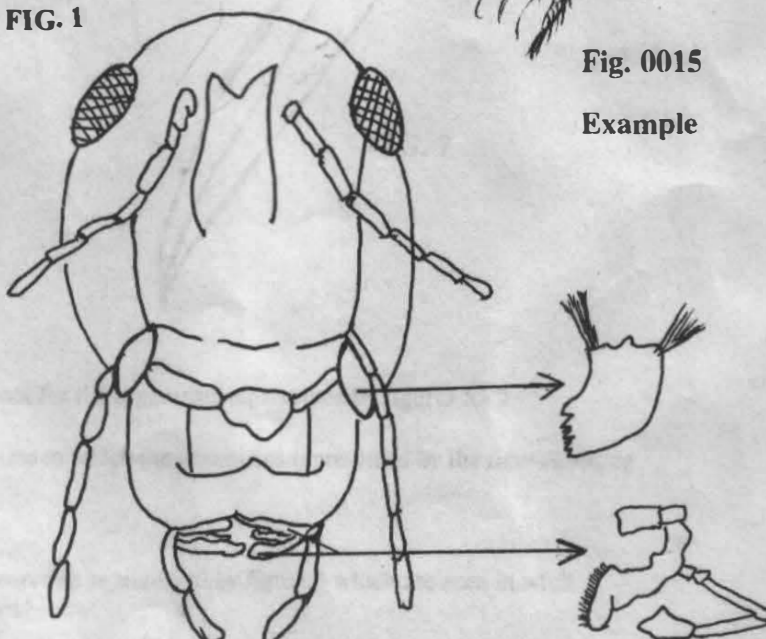


FIG. 4

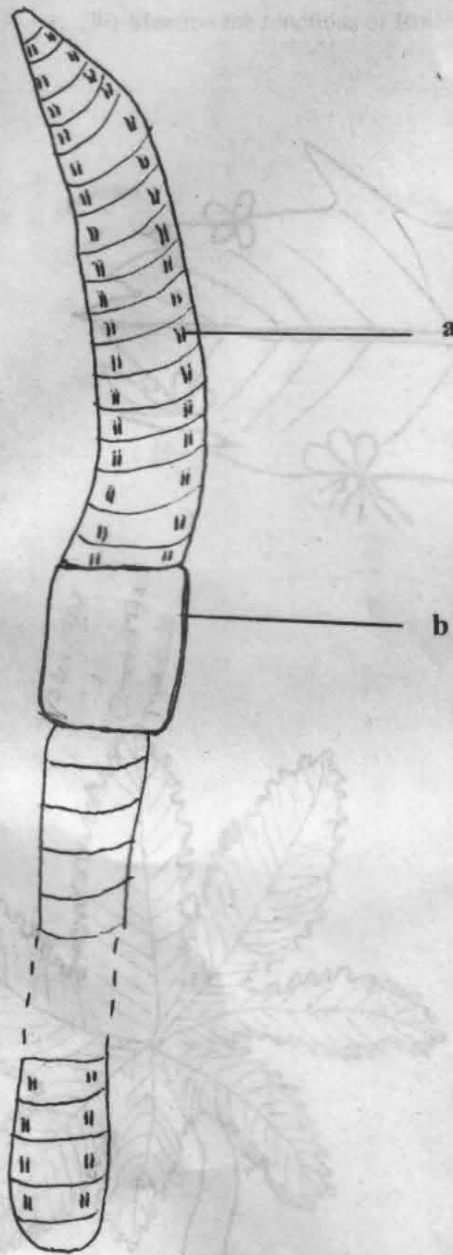
Complete the table.

Fig	Shape of mouth	Feeding habit
0015	Thick tough sharp and carved	For cracking nuts in order to get seeds
1		
2		
3		
4		

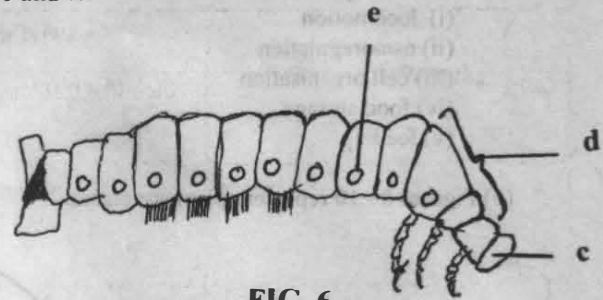
(11 marks)



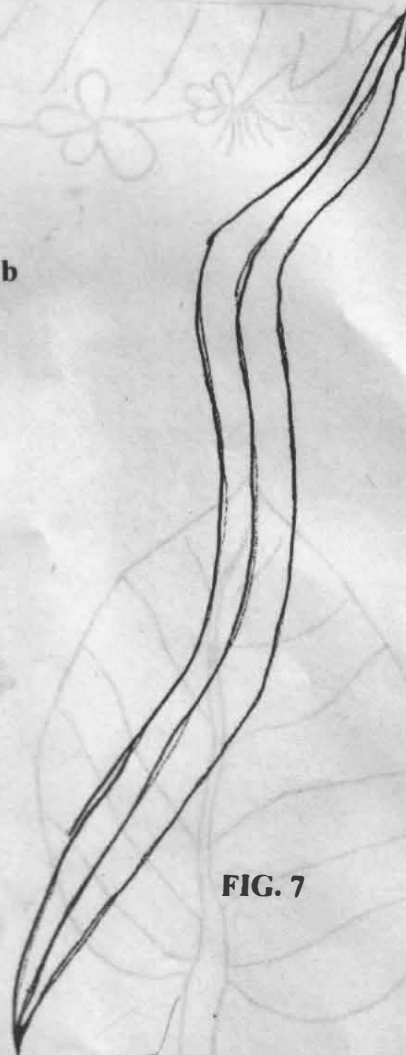
4. Study the organisms represented by figures 5, 6 and 7.



**FIG. 5**



**FIG. 6**



**FIG. 7**

- Provide common names for the organisms represented by figures 5 - 7.
- Give the phyla and class to which the organisms represented by the figures belong.
- Label parts a - e.
- What features are observable represented by figure 6 which are seen in adult stages of the organism?
- Which features are present in the adult stage of figure 6?

5. (a) Draw a diagram to show the structure of paramecium and label structures used for:-
- (i) locomotion
  - (ii) osmoregulation
  - (iii) cell organisation
  - (iv) food storage
  - (v) feeding

(b) Figures 8 - 10 represent plant structures.

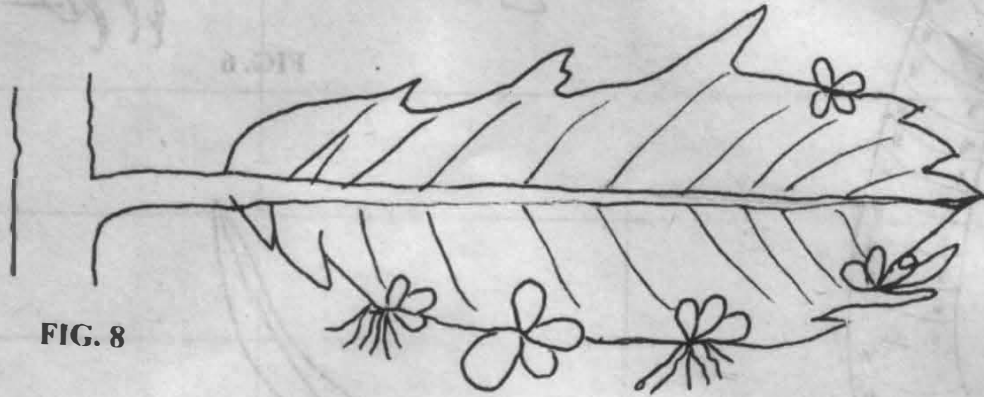


FIG. 8

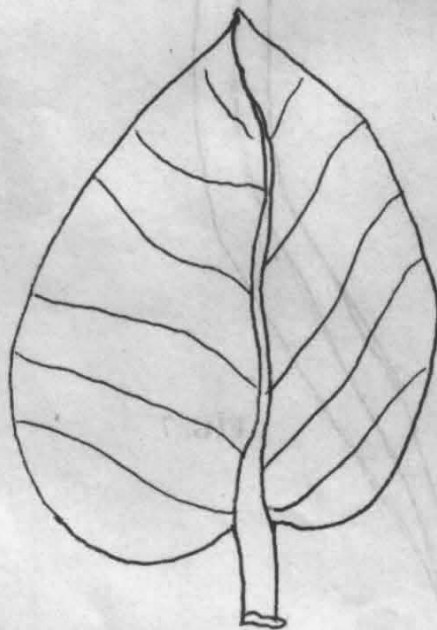


FIG. 9



FIG. 10



7

- (i) What plant part do these figures represent?
- (ii) Differentiate figures 9 and 10 by their types.
- (iii) Mention the functions of structure 8.

7 marks