

THE UNITED REPUBLIC OF TANZANIA  
NATIONAL EXAMINATIONS COUNCIL  
CERTIFICATE OF SECONDARY EDUCATION EXAMINATION, 1997

033/2

BIOLOGY PAPER 2  
ALTERNATIVE TO PRACTICAL  
(For both School and Private Candidates)

TIME: 2:30 Hours.

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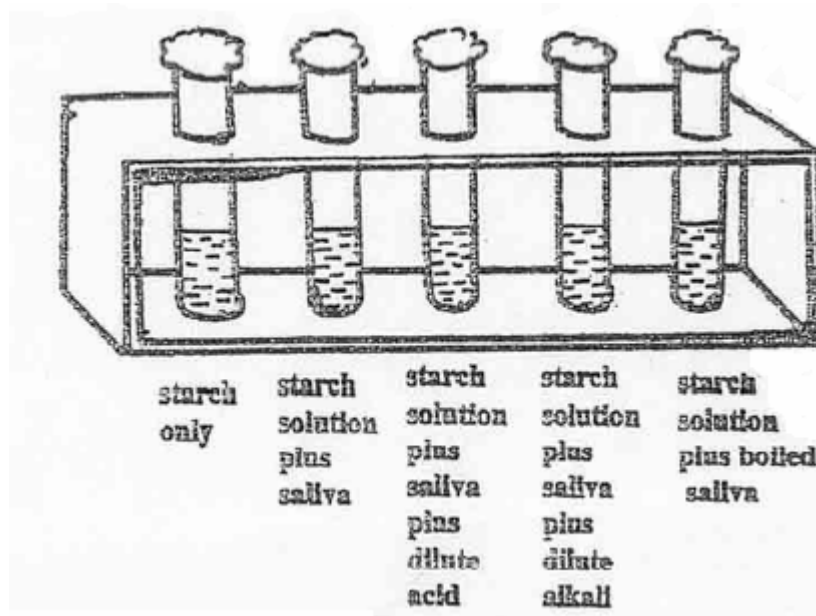
INSTRUCTIONS TO CANDIDATES

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

FAILURE TO FOLLOW INSTRUCTIONS WILL LEAD TO LOSS OF MARKS.

This paper consists of 5 printed pages

1. In an experiment,  $5\text{cm}^3$  of starch solution was placed in each of the 5 test-tubes labeled A, B, C and E. The contents of the 5 test-tubes were then varied as shown in the diagram below (Fig. 1)



Fig

The five test-tubes were placed in a water-bath at  $36^\circ\text{C}$ .

At timed intervals for a period of 10 minutes, samples from each test-tube were tested with iodine for the presence of starch.

- In which test-tube do you think the starch disappeared fastest? Why?
- What do you think happened to the starch in the test-tube you have mentioned in 1(a) above?
- How could you test what the starch changed into?
- What was the purpose of including test-tube A and E in experiment?

(10 marks)

2. Two, completely dry soil samples A and B were placed in two filter funnels and the apparatus set as shown below (Fig.20)

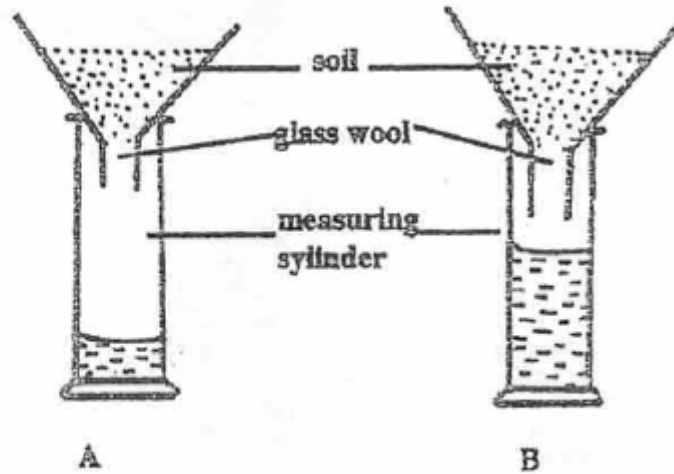


Fig. 2

100cm<sup>3</sup> of water were poured into each funnel. After the water had stopped dripping through each funnel it was noted that 20cm<sup>3</sup> of water had passed through soil sample A and 90cm<sup>3</sup> had passed through soil sample B.

- (a) What do you think was the purpose of the experiment?
- (b) From the information you have been given what conclusion can you make about soil samples A and B?
- (c) Suggest the names of soil samples A and B.
- (d) In good-well watered soils the water should take up to a quarter (1/40 of the total volume). With this information in mind, are soils A and B suitable for agriculture? Give reasons for your answer.
3. Study the diagrams of organisms in figs.3-10.



Fig. 3

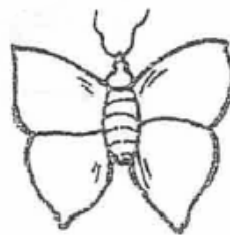


Fig. 4

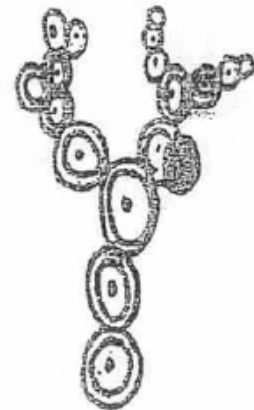


Fig. 5



Fig. 6

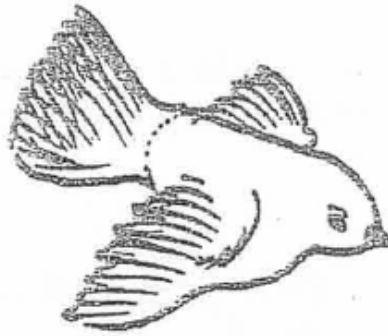


Fig. 7

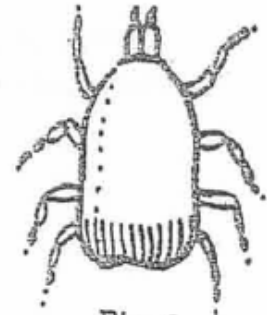


Fig. 8



Fig. 9



Fig. 10

- (a) Identify the organisms illustrated in Figures 3-10 by their common names and state the phylum to which each of them belongs;
  - (b) Name the classes to which organisms 3,6,7 and 8 belong;
  - (c) State the habitats of each of organisms 3,8,9 and 10. (16 marks)
4. The diagrams below Figs.11 and 12, show half flowers of angiosperms.

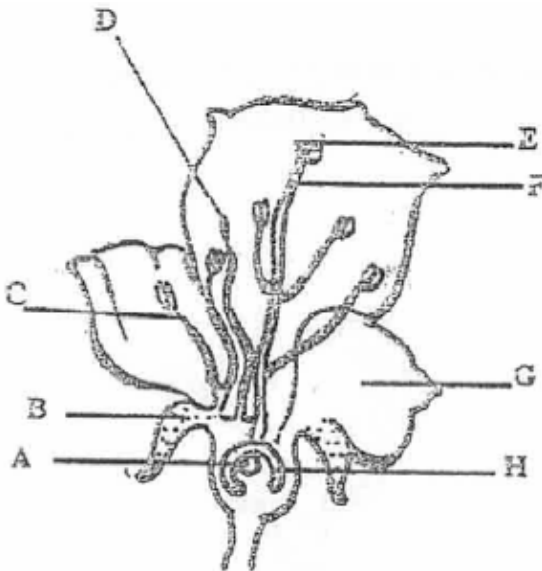


Fig. 11,

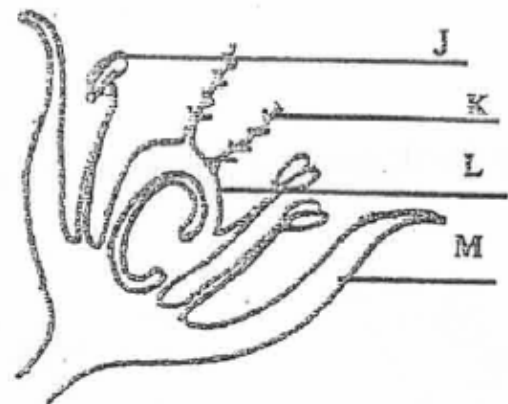


Fig. 12

- (a) Identify the structures labeled A – H;

- (b) Which structures in Fig.11 have the same functions as structures J, K, L and M in Fig. 12? Mention the functions in each case;
- (c) (i) Suggest the modes of pollination showed by the flowers represented by Fig.11 and 12.
- (ii) Write down the adaptive features that are associated with the suggested modes of pollination in each flower. (10 marks)
5. (a) draw a big well labeled diagram of a head of a bony fish showing the structures exposed when the operculum is removed from it.
- (b) What is the function of those main structures beneath the operculum? (6 marks)