THE UNITED REPUBLIC OF TANZANIA
NATIONAL EXAMINATIONS COUNCIL
ADVANCED CERTIFICATE OF SECONDARY EDUCATION
EXAMINATION - MAY, 1994

133/3A

BIOLOGY PAPER 3A
PRACTICAL (Alternative A)
(For both School and Private Candidates)

TIME: 3.15 Hours.

1. Answer ALL questions.
2. Write your Centre and Index Number on every page of your answer book.
3. Except for diagrams, all writing must be in blue or black ink/ball point pens.
4. Read each question carefully.

This paper consists of 3 printed pages.
1. You are provided with specimen S_1. Dissect it in the usual way to fully display the digestive and circulatory systems. Deflect the digestive system and its associated structures to the right hand side of the animal.

   (a) Make a neat well labelled drawing of your dissection
   (b) (i) Which part of the alimentary canal of specimen S_1 is specialized for water absorption?
        (ii) In what ways is the structure you have named above adapted for the functions it performs?

   LEAVE YOUR DISSECTION WELL DISPLAYED FOR ASSESSMENT

2. Solution A, B, C and D contain the same substance in varying concentrations.
   (a) Label four test-tubes as A, B, C and D. Place 10cm³ of the solutions into their respective test tubes.
   (b) Into the contents of each of test-tubes A, B, C and D, add two drops of iodine solution provided.
   (c) Rinse your mouth thoroughly with water, then chew a clean rubber for two minutes.
   (d) Collect about 5cm³ of your saliva in a beaker.
   (e) Dilute the saliva collected by adding 25cm³ of distilled water. Label it saliva solution.
   (f) To the contents of test-tubes A, B and D add 1cm³ of saliva solution at approximately the same time. DO NOT SHAKE.
       (i) Record the time taken for the blue colour to disappear in each of the four test-tubes.
       (ii) What is the nature of the substance? Give reasons for your answer.
       (iii) Why did the blue colour disappear in some of the test-tubes?
       (iv) What investigation is being made in this experiment?
       (v) Which is the most concentrated solution? Give reasons for your answer.
       (vi) Which is the most dilute solution? Give reasons for your answer.
       (vii) What conclusions can you draw from the above investigation?
       (viii) Plot a sketch graph showing the results of your investigation in this experiment.
       (ix) What is the purpose of the experiment in test-tube C?
       (x) Write a word equation for the reaction taking place in test-tube A, B and D.
3. Observe specimen $S_2$ under a microscope at a medium magnification.
   (a) What is the common name of specimen $S_2$?
   (b) (i) Draw and label the structure concerned with asexual reproduction.
   (ii) What specific reproductive role does the structure drawn in (b) (i) above play?

4. Examine the external features of specimen $S_3$ and $S_4$.
   (i) Give the genus name to which each specimen belongs.
   (ii) What common name is given to both animals?
   (iii) In what type of habitat would you expect to find the adult forms of $S_3$ and $S_4$?

5. Using a hand lens study specimen $S_5$ carefully.
   (i) To what subphylum does $S_5$ belong?
   (ii) What are your reasons for placing $S_5$ to the subphylum you named. Restrict your answer to observable characteristics only.
   (iii) Draw and label one pinnule to show the position of the reproductive structures.