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

133/3B **BIOLOGY PAPER 3B**

ALTERNATIVE B PRACTICAL
(For Both School and Private Candidates)

TIME: 3¼ Hours. 27 May 1999 A.M.

INSTRUCTIONS

1. Answer ALL questions
2. Write your Centre and Index Number on every page of your answer booklet.
3. Except for diagrams, which must be drawn in pencil, all writing must be in blue or black ink/ball point pen.
4. Read each question carefully.
5. The mark allocation is indicated at the end of each question.

This paper consists of 4 printed pages

1. Dissect specimen S_1 in the usual way to display the urinogenital system.

   (a) Make a neat, large and well labelled diagram of your dissection.

   (b) (i) Identify the structures in the system you have displayed which have both reproductive and excretory roles. State the role(s) of each of those structures.

   (ii) Name the structures in the urinogenital system of S_1 which have a storage capacity and state the substances stored in each structure.

   LEAVE YOUR DISSECTION WELL DISPLAYED FOR ASSESSMENT

   (20 marks)

2. You are provided with 20% yeast suspension, 5% glucose solution and 0.05% methylene blue solution - a dye whose role is the same as that of Benedict's solution in the test for reducing sugars. The dye becomes colourless when reduced.

   (a) Conduct the experiment outlined in the procedure below.

   (i) Label three test-tubes as X, Y and Z.

   (ii) Using beakers, prepare 3 water baths at temperatures 10°C, 40°C and 70°C as follows:

   10°C - by adding ice to hot water

   40°C - by mixing cold and hot water

   70°C - by adding cold water to hot water.

   (iii) Place $2cm^3$ of the yeast suspension in each of test-tubes X, Y and Z.

   (iv) Add to each of the 3 test-tubes $2cm^3$ of 5% glucose solution and shake well. Allow the tubes to stand at room temperature for about 10 minutes.

   (v) Place test-tubes X, Y and Z in the 10°C, 40°C and 70°C water baths respectively. Leave for a few minutes for the suspensions to stabilize at these temperatures.

   (vi) Add 5 drops of 0.05% methylene blue to each test-tube and cork to exclude all air. Note the initial time.

   (vii) Note the time taken for the blue colour to disappear in each of the test-tubes.

Tabulate your results as follows:

Test-tube	Temperature °C	Time taken for blue colour to disappear
X	10	
Y	40	
Z	70	

   (b) (i) What is the aim of the experiment?

   (ii) Give explanations for the results in test-tubes X, Y and Z.

(iii) What is the role of yeast in the experiment?

(iv) What would be the possible effects of increasing the concentrations of glucose?

(10 Marks)

3. (a) Specimen S_2 was obtained from an angiosperm plant. Using a sharp scalpel or a razor blade cut S_2 longitudinally so as to obtain two halves which show EDGE VIEW of the inner structure. With the help of a hand lens study the cut end of one of the sections of S_2. Draw and label.

(i) Name the subclass to which S_2 belongs and state observable feature(s) in S_2 which support(s) your answer.

(ii) From what part of a plant did S_2 develop?

(iii) Outline the functions of the parts of S_2 you named in your diagram.

(b) Using a hand lens study specimen S_3 carefully.

(i) Draw and label S_3

(ii) What stage of life-cycle does S_3 represent?

(iii) State the natural habitat of S_3. (10 Marks)

4. (a) In the key given below, letters Q, R, S, T, U, V, W and X represent groups or types of fruits. Use the key to identify the group of fruits to which specimens S_4 and S_5 belong. Write down the sequence of the leads which directed you to the answer.

KEY TO SOME COMMON FRUIT TYPES

1. (a) True fruit, that is formed only from the ovary wall ---------- 3

   (b) Fruit is false ---------- 2

2. (a) Fruit formed mainly from the receptacle ---------- Q

   (c) Fruit formed mainly from the inflorescence ---------- R

3. (a) Fruit is dry ---------- 5

   (b) Fruit is succulent ---------- 4

4. (a) Fruit indehiscent with one carpel and hard stony endocarp ---------- S

   (b) Fruit indehiscent with two or more carpels, with a fluidy endocarp ---------- T

5. (a) Fruit dehiscent ---------- 7

   (b) Fruit indehiscent ---------- 6

6. (a) Fruit with one carpel, seed free with woody (stony) pericarp ---------- U

   (b) Fruit with one carpel and pericarp fused with testa ---------- V

7. (a) Fruit with one carpel ---------- 8

(b) Fruit with two or more carpels ---------- 9

8. (a) Fruit splits along two lines ---------- W

(b) Fruit with one line of splitting ---------- X

(b) Using a sharp scalpel or razor blade make a longitudinal section through the middle region of S_5 so as to produce two identical halves. Draw a large labelled diagram of one half of S_5 to show the different parts of the cut surface.

(10 Marks)