THE UNITED REPUBLIC OF TANZANIA

NATIONAL EXAMINATIONS COUNCIL

ADVANCED CERTIFICATE OF SECONDARY EDUCATION EXAMINATION

MAY 1997

133/3A

BIOLOGY PAPER 3A

PRACTICAL - ALTERNATIVE A

(For Both School and Private Candidates)

TIME : $3\frac{1}{4}$ Hours

IMPORTANT

1. Answer ALL questions.
2. Write your centre and index number on every page of your answer book.
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 fully display the spinal nerves and the sympathetic nervous system.

   (a) Make a large and neat drawing of your dissection. (8 marks)

   (b) Label on your drawing the following

   hypoglossal nerve
   branchial nerve
   sympathetic cord
   sympathetic ganglion
   ramus comunicans
   spinal nerves 7, 8, 9 & 10
   sciatic plexus
   sciatic nerve (22 marks)

   NOTE: In order to be able to display the above structures clearly, it is best to remove the stomach, lungs, heart, kidneys and any overlying tissue; but take care not to cut the aorta.

   (c) LEAVE YOUR DISSECTION PROPERLY DISPLAYED FOR ASSESSMENT. (10 marks)

   (Total 40 marks)

2. You are provided with specimens S_2 and S_3, each in powder and solution forms. Specimens S_2 and S_3 were obtained from ungerminated and germinated grains of finger millet respectively.

   (a) Using the apparatus and reagents provided, carry out similar biochemical tests for carbohydrates to both specimens S_2 and S_3.

   Tabulate your procedure, observations and inferences as shown below.

Specimen	Food Substance tested	Procedure	Observation	Inference

(11 marks)

(b) (i) Name the biochemical process by which the type of carbohydrate in specimen S_2 was converted to the type of carbohydrate in specimen S_3. (2 marks)

(ii) Write a word equation to represent the biochemical process named in (b) (i) above. (5 marks)

(iii) What is the biological significance of this process in living organisms? (2 marks)

(Total 20 marks)

3. Study specimen S_4 carefully.

(a) (i) Detach one young circinate leaf from the plant and examine it using a hand lens. Draw and label the young leaf. (6 marks)

(ii) What phase of the life cycle does specimen S_4 represent? (2 marks)

(b) Classify the specimen up to class level and give one observable distinctive feature for each of the classification ranks mentioned. (12 marks)

(Total 20 marks)

4. Carefully study the external features of the six animals labelled "SPECIMENS FOR Q.4" using a hand lens.

(a) Identify the specimens using the key provided below by writing down systematically, the numbers and letters of the leads which directed you to the letter of the specimen. (11 marks)

KEY FOR THE IDENTIFICATION OF THE SIX ANIMALS

1a	wings ----------	2
1b	no wings ----------	3
2a	abdomen with cerci ----------	E
2b	abdomen without cerci ----------	C
3a	3 distinct body divisions ----------	B
3b	2 distinct body divisions ----------	4
4a	antenna ----------	5
4b	no antenna ----------	A
5a	walking legs 1 pair per body somite ----------	D
5b	walking legs 2 pairs per body somite ----------	F

4. Cont.

(b) Give common names for specimens A - F. (3 marks)

(c) Classify specimen C by naming its phylum, class and order. (3 marks)

(d) Name the respiratory organs for specimens A and E. (3 marks)

(Total 20 marks)