

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

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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 ~~un~~germinated 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)

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