

THE UNITED REPUBLIC OF TANZANIA  
NATIONAL EXAMINATIONS COUNCIL  
ADVANCED CERTIFICATE OF SECONDARY EDUCATION EXAMINATION  
MAY 1998

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 black or blue 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. Open up the abdominal cavity of specimen, S<sub>1</sub> in the usual way. Carefully move the bulk of the visceral contents to your left and rearrange, but with minimum disturbance, the various parts so as to display them fully.

- (a) (i) Draw a large and neat diagram of the dissection.  
(ii) Using letters A - I, label on the diagram the organs and structures concerned with the functions listed below.

<u>Label</u>	<u>function</u>
A	- temporary storage of food
B	- exocrine and endocrine secretion
C	- final digestion of food and intensive absorption of soluble nutrients.
D	- transportation of products of digestion from the gut to the liver.
E	- active absorption of water
F	- production of bile
G	- reception of chyme
H	- temporary storage of undigested food remnants
I	- microbial breakdown of cellulose.

(iii) Give the biological names of structures A - I. (24 marks)

(b) (i) What two products of digestion are transported by structure D?

(ii) Mention two other roles of each of structures A and F. (6 marks)

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

Total 40 Marks.

2. Mr. Weakhead, a laboratory assistant at Bahatisha High School prepared four solutions each containing one pure food substance. In his haste, he unfortunately interchanged the labels. The solutions were wrongly labelled as follows:

- Solution A - Sucrose
- Solution B - Glucose
- Solution C - Protein
- Solution D - Starch.

(a) Design and conduct experiments to identify the correct food substance in each solution by using ONLY the following reagents:

Benedict's solution,  
dilute hydrochloric acid (HCl),  
dilute sodium hydroxide solution (NaOH), and  
your saliva collected after thorough mouth rinsing, then  
diluting with about equal volume of distilled water.

Tabulate your observations as shown below:

Food substance tested	Procedure	Observation	Inference

(22 marks)

- (b) (i) Why was it necessary to rinse well your mouth before collecting saliva? (2 marks)
- (ii) Very briefly explain why saliva was used in your experiments. (2 marks)
- (c) One of the food substances contained in one of the four solutions above is normally stored under the influence of a hormone should it occur in excess in the body.
- (i) Name the hormone involved (1 mark)
- (ii) In what form is the food substance stored? (1 mark)
- (iii) Where in the body is it stored? (2 marks)
- (Total 30 marks).
3. (a) Using a hand lens, carefully study specimens  $S_2$  and  $S_3$ .
- (i) Identify each specimen by its genus name (2 marks)
- (ii) Name the kingdoms and the phyla to which specimens  $S_2$  and  $S_3$  belong. (4 marks)
- (iii) What two outstanding, observable features distinguish specimens  $S_2$  and  $S_3$ ? (2 marks)
- (b) Examine specimen  $S_4$  with the aid of a hand lens.
- (i) Provide the floral diagram and floral formula for specimen  $S_4$ . (6 marks)
- (ii) Give the family name for the plant from which specimen  $S_4$  was collected. (1 mark)
- (iii) Where exactly in specimen  $S_4$  is the female gametophyte located? (1 mark)
- (Total 16 marks).
4. (a) Specimens  $S_5$  and  $S_6$  belong to the same Kingdom as you. Observe their features carefully.
- (i) What is the lowest level of the classification hierarchy shared by you and the 2 animal specimens? (1 mark)

- (ii) Name the classes to which specimens  $S_5$  and  $S_6$  belong. (2 marks)
  - (iii) In what kind of habitats would you expect to find specimens  $S_5$  and  $S_6$ ? (2 marks)
  - (iv) Identify any two observable features which adapt each specimen to its habitat. (2 marks)
- (b) Examine the external features of specimens  $S_7$  and  $S_8$ .
- (i) Give the common name for each specimen. (2 marks)
  - (ii) What is the importance of specimen  $S_7$  to angiosperms? (1 mark)
  - (iii) Draw and label specimen  $S_8$  to show its external features. (4 marks)

(Total 14 marks).

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