

THE UNITED REPUBLIC OF TANZANIA  
NATIONAL EXAMINATIONS COUNCIL  
ADVANCED CERTIFICATE OF SECONDARY EDUCATION EXAMINATION  
MAY 1991

133/3

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

TIME: 3.15 Hours

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IMPORTANT

The following instructions must be strictly adhered to. Failure to do so may lead to loss of marks.

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. Bisect specimen  $S_1$  provided to fully display all veins posterior to the heart. Make a large drawing of your dissection and label fully.

LEAVE YOUR DISSECTION PROPERLY DISPLAYED FOR ASSESSMENT AFTER THE EXAMINATION.

2. You are provided with test-tubes L, M and N containing starch, sucrose and a protein. You are also provided with an enzyme capable of digesting a carbohydrate and Benedict's solution. Rinse your mouth with water to remove food particles. Collect about  $5\text{cm}^3$  of saliva in a clean test-tube, dilute it with a little amount of water and label it SALIVA solution.

- (a) Carry out experiments using only the materials provided and the saliva solution to determine the contents of the tubes L, M and N. Record your procedure, observations and inference as shown in table 1. Summarise your results as shown in table 2.
- (b) What general conclusion about enzymes can be drawn from the experiments? Explain your answer on the basis of your experiments in Q.1(a) above.

Table 1

Substance tested	Procedure	Observation	Inference

Table 2

Test-tube.	Substance present
L	
M	
N	

3. (a) Examine specimens  $S_2$  and  $S_3$  carefully. Identify the specimens using the key provided by writing down the number for the positive statement until you arrive at the correct group name for the specimen.  
N.B. Work with one specimen at a time.

A KEY TO SOME COMMON FRUITS

- 1a Fruits dry ..... 3  
1b Fruits succulent ..... 2

2a	2 to many - seeded; seeds embedded in fleshy pericarp .....	BERRY
2b	1 - seeded; seed enclosed in a hard inner layer of pericarp ...	DRUPE
3a	Dehiscent .....	4
3b	Indehiscent .....	6
4a	Formed from 2 or more carpels .....	CAPSULE
4b	Formed from 1 carpel .....	5
5a	Having 2 lines of dehiscence (i.e. splitting down both sides)	LEGUME
5b	Having 1 line of dehiscence .....	FOLLICLE
6a	Formed from 1 carpel .....	7
6b	Formed from more than 1 carpel .....	9
7a	Breaking into 1 - seeded portions at maturity .....	LOMENTUM
7b	Not breaking into 1 - seeded portions at maturity, normally containing only 1 seed .....	8
8a	Pericarp winged .....	SAMARA
8b	Pericarp not winged .....	ACHENE
9a	Pericarp winged .....	SAMARA
9b	Pericarp not winged .....	10
10a	Seed free within pericarp, pericarp woody .....	NUT
10b	Seed fused to pericarp .....	CARYOPSIS

- (b) Give a floral diagram and formula of specimen  $S_4$ .
4. (a) An animal has the following diagnostic features: mouth parts suctorial, have a bulbous sponging enlargement at the end of a proboscis; larvae have very small heads, legless and have no eyes; forewings transparent, few veins hind wings form halteres; diurnal and arista plumed to tip.
- (i) Which one of specimens X, Y and Z fits best to these features?
- (ii) Give the scientific name of the specimen you have selected in Q.4 (a)(i) above.
- (iii) Name the phylum, class, order and family to which the specimen you have selected in Q.4 (a)(i) belongs.
- (b) Study specimens  $S_5$  and  $S_6$  carefully. Give three observable features which make the specimens differ from each other.
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