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

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. Bissect 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 $5cm^3$ 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 halters; 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.