THE UNITED REPUBLIC OF TANZANIA

NATIONAL EXAMINATIONS COUNCIL

ADVANCED CERTIFICATE OF SECONDARY EDUCATION EXAMINATION

MAY 1996

133/3B

# BIOLOGY PAPER 3B

## PRACTICAL - ALTERNATIVE B

(For Both School and Private Candidates)

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

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## INSTRUCTIONS TO CANDIDATES

1. Answer ALL questions.
2. Read each question carefully.
3. The marks in brackets indicate the relative credit given to each question or part thereof.
4. Except for diagrams, which must be drawn in pencil, all writing must be in blue or black ink/ball point pen.
5. Write your centre and index number on every page of your answer book provided.

This paper consists of 4 printed pages.

1. You have been provided with specimen $S_1$. Dissect it in the usual way to fully display the reproductive and excretory systems. Deflect the digestive system to your right side so as to clearly show the systems asked for.

   (a) Make a large, neat well labelled diagram of your dissection. (20 marks)

   (b) Carefully examine the excretory system with a hand lens and state the structural adaptations which help to increase the total surface area for secretion and excretion. (6 marks)

   (c) Name the structures in the reproductive system of the animal that are responsible for gamete production. (4 marks)

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

   (Total 40 marks)

2. Using the chemicals and reagent provided carry out food tests to identify the different food substances which may be present in specimens A and B, also provided.

   For each type of food substance tested, record your procedure, observation and inference as shown in the table below.

| Food substance tested | Procedure | Observation | Inference |
|---|---|---|---|
| | | | |

(30 marks)

3. (a) Study specimen $S_2$ carefully.

   (i) Give the common name for $S_2$ (1 mark)

   (ii) To which phylum does $S_2$ belong? (1 mark)

   (iii) Make a drawing of $S_2$ and label the sporophyte phase and gametophyte phase. (6 marks)

   (iv) What two features make $S_2$ more adapted to terrestrial habitat than its close relatives of the class hepaticae? (2 marks)

   (b) Carefully observe specimens $S_3$ and $S_4$.

   (i) Name the class to which each of them belongs. (2 marks)

   (ii) What features have enabled you to classify the two specimens into their respective classes? (6 marks)

3. (b) Cont.

(iii) What features do specimens $S_2$ and $S_4$ have in common? (2 mark

(Total 20 ma

4. You are provided with specimens $S_5$, $S_6$ and $S_7$. Using a sharp scal or razor blade cut specimen $S_5$ longitudinally so as to produce two id halves.

(a) What type of placentation is displayed by $S_5$? (1 mark

(b) Write down the floral formulae for $S_5$, $S_6$ and $S_7$. (3 mark

(c) Using the key provided below, classify specimens $S_5$, $S_6$ and S, their correct families. Show how you arrive at the correct famil name by writing down the numbers and letters of the leads which directed you to the correct name. (6 mark

(Total 10 ma

## KEY TO THE FAMILIES OF SOME COMMON FLOWERS

1. (a) Flower unisexual ---------- 5
   (b) Flower bisexual ---------- 2
2. (a) Flower regular ---------- 6
   (b) Flower irregular ---------- 3
3. (a) Sepals fused with flower stalk, spur present ------- 4
   (b) 5 sepals which are petal like, ovary with capsule (locule) ---------- POLYGALA
4. (a) Flower with stipules and ovary with 5 locules (cells) each locule with 1 seed ---------- GERANICE
   (b) Flower without stipules but with many locules and each locule with many seeds ---------- BALSAMINA
5. (a) Flower staminate, filaments free with large loosely attached dangling anthers. Glumes present ------- POECIAE
6. (a) Filaments fused into a single tube or several tubes, either completely or partially ---------- 7
   (b) Stamens with free filaments ---------- 10
7. (a) Filaments of the stamens all joined at the base or joined in several bundles ---------- 8
   (b) Filaments of the stamens are all joined to make a staminal tube except for very short branches which attach to the anthers ---------- 10

| | | | |
|---|---|---|---|
| 8. | (a) | One style, sometimes divided at the tip ---------- | 9 |
| | (b) | More than one style ---------- | 11 |
| 9. | (a) | Petals twisted in bud and ovary capsulated --------- | OCHNACEAE |
| | (b) | Petals not twisted in bud, ovary 2 to 10 locules ---------- | TILIACEAE |
| 10. | (a) | Numerous fertile anthers with one cell (locule). Each ovary with locules or with carpels separating from one another ---------- | MALVACEAE |
| | (b) | 5 - 15 stamens, which are almost all fertile and with 2 locules ---------- | STERCULACEAE |
| 11. | (a) | With several styles. Ovary with long beak ------ | GERANICEAE |
| | (b) | With 5 styles, and ovary not beaked ---------- | LINACEAE |