**THE UNITED REPUBLIC OF TANZANIA**

**NATIONAL EXAMINATIONS COUNCIL**

**ADVANCED CERTIFICATE OF SECONDARY EDUCATION EXAMINATION**

**133/3 BIOLOGY 3**

**(ACTUAL PRACTICAL)**

(For Both School and Private Candidates)

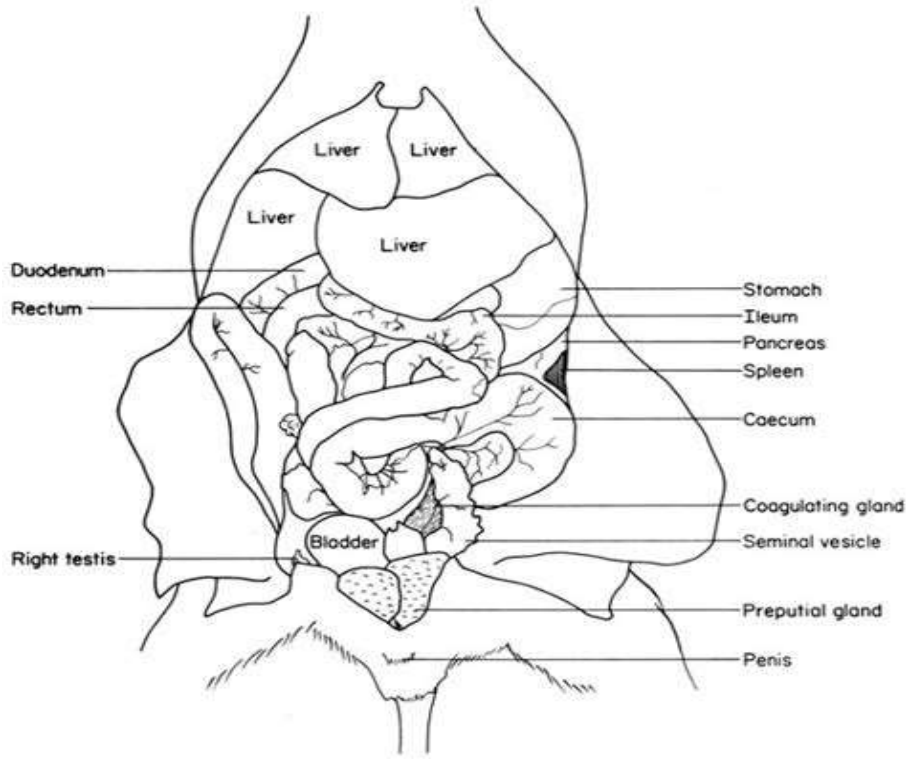
**Time: 2:30 Hours** **ANSWERS** **Year: 1990**

**Instructions**

1. This paper consists of three questions.

2. Answer all questions.

1. Dissect specimen $S_1$ provided to fully reveal and display the arterial system of the left side of the animal.
Make a large drawing of your dissection and label fully.




2. You have been provided with four types of solutions namely A, B, C, and D. Using the chemicals and reagents provided, carry out food tests to identify the food substance present in each of the four types of solutions. For each food substance tested, record your procedure, observation and inference as shown in table 1. Summarise your results as shown in table 2.

Table 1

| Food Substance Tested | Procedure | Observation | Inference |
|---|---|---|---|
| A | Add iodine solution | Blue-black color appears | Starch present |
| B | Add Benedict's solution and warm | Brick-red precipitate forms | Reducing sugar present |
| C | Add Biuret solution | Purple/violet coloration | Protein present |
| D | Add ethanol and water (emulsion test) | Milky white emulsion forms | Lipids/fat present |

Table 2

| Solution | Food Substance Present |
|---|---|
| A | Starch |
| B | Reducing sugar |
| C | Protein |
| D | Lipid |

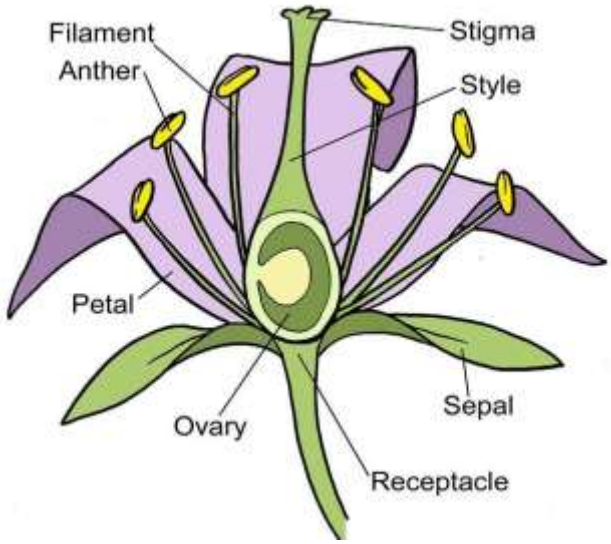
3. With the help of the key provided below, identify specimens $S_2$ and $S_3$ by writing down the number for the positive statement until you arrive at the correct order for each specimen. Work with one specimen at a time.

Key to some insect orders:

Example:
If $S_2$ is wingless, go to 2. If antennae are present, go to 3. If abdomen has no extension, go to 5. If eyes are present and conspicuous, go to 6. If mouthparts not tubular, for biting and chewing, go to 7. If body is flattened and sucking tube is short and conical, it is THYSANOPTERA.

If $S_3$ is winged, go to 8. If wings are 2 pairs, go to 9. If wings are leathery at base and membranous at tip, mouth parts in the form of long sucking tube, it is HEMIPTERA.

4. (a) You are provided with specimen $S_4$. Obtain one flower from a spikelet. Using a pin or dissecting needle, open up the flower by pushing the lemma and palea sideways.
(i) Make an accurate labelled drawing of the flower.
(ii) Draw the floral diagram of the flower.




(b) Place a small drop of the solution labelled $S_5$ on a clean microscope slide. Put a cover slip on top and examine, first under low power, then under high power of the microscope.

(i) Identify the organism(s)
(e.g., Paramecium, Euglena, Amoeba depending on content)
(ii) Draw and label the organism(s)
(iii) From your observations suggest how the organisms form food.
(Paramecium – cilia sweep food into oral groove.
Euglena – autotrophic via chloroplasts and heterotrophic through phagocytosis.
Amoeba – phagocytosis using pseudopodia.)