**THE UNITED REPUBLIC OF TANZANIA**

**NATIONAL EXAMINATIONS COUNCIL**

**ADVANCED CERTIFICATE OF SECONDARY EDUCATION EXAMINATION**

**133/3A** **BIOLOGY 3A**

**(ACTUAL PRACTICAL A)**

(For Both School and Private Candidates)

**Time: 2:30 Hours** **ANSWERS** **Year: 1999**

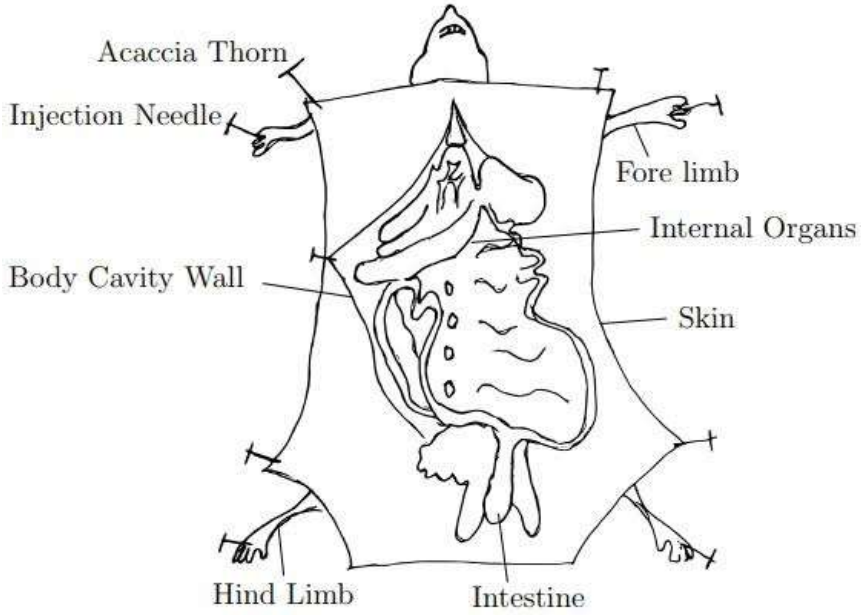
**Instructions**

1. This paper consists of three questions.

2. Answer all questions.

1.Dissect specimen $S_1$ in the usual way. Deflect the gut to YOUR right-hand side and then fully display the following:
- Components of the gut between the stomach and the rectum.
- Glands associated with digestion including their ducts.
- Hepatic portal vein and hepatic vein.

(a) Draw a large, neat well labelled diagram of your dissection.
The diagram should show:
- Stomach
- Small intestine: duodenum, jejunum, ileum
- Large intestine: colon and rectum
- Pancreas and its duct
- Liver and bile duct
- Hepatic portal vein connecting intestines to liver
- Hepatic vein draining into vena cava




(b) (i) State the functions of the veins named above.
Hepatic portal vein -----> Transports nutrient-rich blood from the intestines to the liver for processing.
Hepatic vein -----> Carries deoxygenated blood from the liver to the inferior vena cava.

(ii) Where in specimen $S_1$ do the following processes take place?
Maceration of food and digestion of lipids.
- Maceration of food -----> Stomach

- Digestion of lipids -----> Duodenum (with help of bile and pancreatic lipase)

(c) LEAVE YOUR DISSECTION WELL DISPLAYED FOR ASSESSMENT. (10 MARKS)

2.You are provided with specimens $S_2$, $S_3$ and $S_4$ in solution form. One of the specimens contains two types of food substances, and the remaining specimens contain one type of food substance each. Using the chemical reagents provided, design and carry out tests to identify the food substances present in $S_2$, $S_3$ and $S_4$. Tabulate your results in the usual way. (30 marks)

| Specimen | Test Performed | Observation | Inference |
|---|---|---|---|
| $S_2$ | Add Benedict's solution and boil | Brick-red precipitate forms | Reducing sugar present |
| $S_3$ | Add Biuret reagent | Purple coloration | Protein present |
| $S_4$ | Add iodine solution | Blue-black coloration | Starch present |
| $S_4$ | Add Benedict's solution and boil | Brick-red precipitate forms | Reducing sugar also present |

3.(a) Study specimen $S_5$ carefully.
(i) Give the technical term for specimen $S_5$.
Fruit

(ii) To what family does $S_5$ belong?
Fabaceae (Leguminosae)

(iii) Using a scalpel or razor, make a longitudinal section (L.S.) of specimen $S_5$ so as to divide it into two equal halves. Observe the cut side of the halves by using a hand lens. Draw and label. The drawing should include:
- Pericarp
- Seed
- Funicle
- Ovary wall

(iv) State the functions of the parts you labelled in 3(a)(iii).
- Pericarp -----> Protects the seed
- Seed -----> Develops into new plant
- Funicle -----> Attaches seed to ovary wall
- Ovary wall -----> Forms the fruit covering

(b) Carefully examine specimen $S_6$.
(i) What is the common name for $S_6$?
Mango

(ii) State the phylum to which $S_6$ belongs.
Angiospermophyta

(iii) Where in nature do you expect to find specimen $S_6$?
On a mango tree (Mangifera indica) or at fruit markets

3.You are provided with specimens $S_5$ and $S_6$. With the help of the key provided below, identify specimens $S_5$ and $S_6$ by writing down the number for the positive statement until you arrive at the correct order (represented by letters) for each specimen. Work with one specimen at a time.

Using the key:

Specimen $S_5$:
1b (Winged)
2a (Antennae present)
3b (Abdomen without extensions)
4a (Eyes absent) -----> Order B

Specimen $S_6$:
1b (Winged)
2a (Antennae present)
3b (Abdomen without extensions)
4b (Eyes present)
5b (Mouthparts not tubular)
6b (Sucking tube short and coiled) -----> Order E