THE UNITED REPUBLIC OF TANZANIA

NATIONAL EXAMINATIONS COUNCIL

ADVANCED CERTIFICATE OF SECONDARY EDUCATION EXAMINATION

133/3B **BIOLOGY 3B**

(ACTUAL PRACTICAL B)

(For Both School and Private Candidates)

Time: 2:30 Hours **ANSWERS** **Year: 2000**

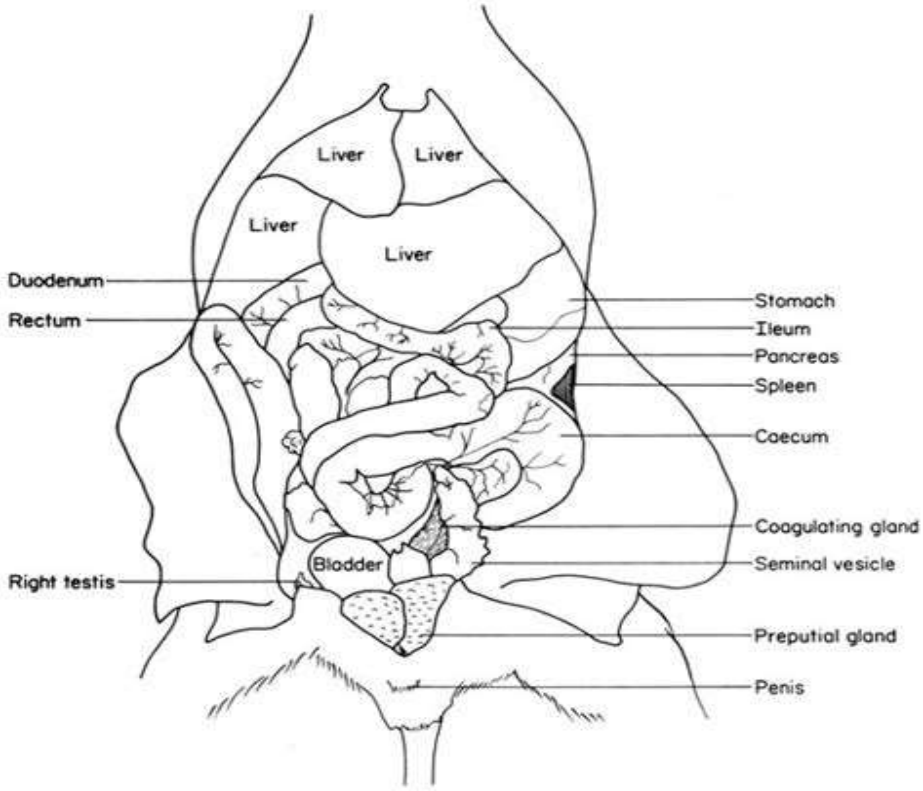
Instructions

1. This paper consists of three questions.

2. Answer all questions.

1.Dissect specimen S_1 in the usual way to display the digestive system. Pin the alimentary canal to your right-hand side.

(a) (i) Draw a large diagram of the dissection.
The diagram should include:
- Mouth
- Oesophagus
- Stomach
- Small intestine (duodenum, ileum)
- Large intestine (colon, rectum)



- Anus

(ii) Using letters A to E, label on the diagram the organs/structures responsible for the functions listed:

Label | Function
A -----> Secretion of saliva -----> Salivary glands
B -----> Increasing surface area for absorption -----> Villi in small intestine
C -----> Excretion -----> Anus
D -----> Temporary storage of faeces -----> Rectum
E -----> Secretion of proteases, lipase, and carbohydrases -----> Pancreas

(b)(i) What is the other function of structure D?
Absorption of water from undigested food

(ii) What structure is possessed by E that protects it from abrasion by undigestible particles?
Mucus-secreting epithelial lining

(c) LEAVE YOUR DISSECTION PROPERLY DISPLAYED FOR ASSESSMENT.

2. Design and carry out experiments to identify solutions A_1, A_2, A_3, A_4, A_5, and A_6 using the following reagents only:
- Benedict's solution
- Dilute hydrochloric acid
- Dilute sodium hydroxide solution
- 1% Copper (II) sulphate (Biuret) solution
- Saliva (properly collected)

(a) Record your work in a table as shown:

Food substance tested	Procedure	Observations	Inference
Glucose	Add Benedict's solution and boil	Brick-red precipitate	Reducing sugar present
Sucrose	Add HCl, boil, cool, add NaOH and Benedict's, then boil	Brick-red precipitate	Non-reducing sugar present
Starch	Add iodine	Blue-black color	Starch present
Protein	Add Biuret ($NaOH + CuSO_4$)	Purple/violet color	Protein present

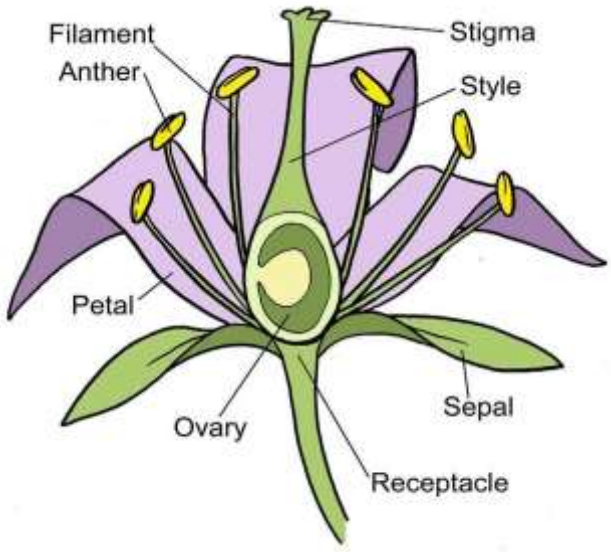
(b) Why were you told to rinse your mouth properly before collecting saliva?
To remove any food residue or sugar that may interfere with the test results

(c) Justify the use of saliva in your experiment.
Saliva contains amylase enzyme which breaks down starch into maltose for identification using Benedict's test

(d)

Name of pure substance	Natural plant source	Main function
Glucose	Grapes	Provides instant energy
Sucrose	Sugarcane	Transportable energy form in plants
Starch	Maize	Energy storage
Protein	Beans	Tissue building and repair

3. (a) Cut a transverse section (T.S) of S_9. Observe the cut surface. Draw and label.



(b) Determine the placentation of specimen S_7. Draw and label.
Example: Axile placentation — ovules arranged around central axis inside a multilocular ovary

(c) Construct a simple numbered dichotomous key using mainly FRUIT WALL characteristics to identify specimens S_2 to S_9. Example:

1a. Fruit wall dry at maturity -----> go to 2
1b. Fruit wall fleshy at maturity -----> go to 5
2a. Splits open to release seeds -----> Dehiscent (e.g. legume)
2b. Does not split open -----> Indehiscent (e.g. nut)
5a. Entire fruit edible -----> go to 6
5b. Partially edible -----> Drupe (e.g. mango)
6a. Many seeds -----> Berry
6b. One seed -----> Drupe or pome