**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: 1994**

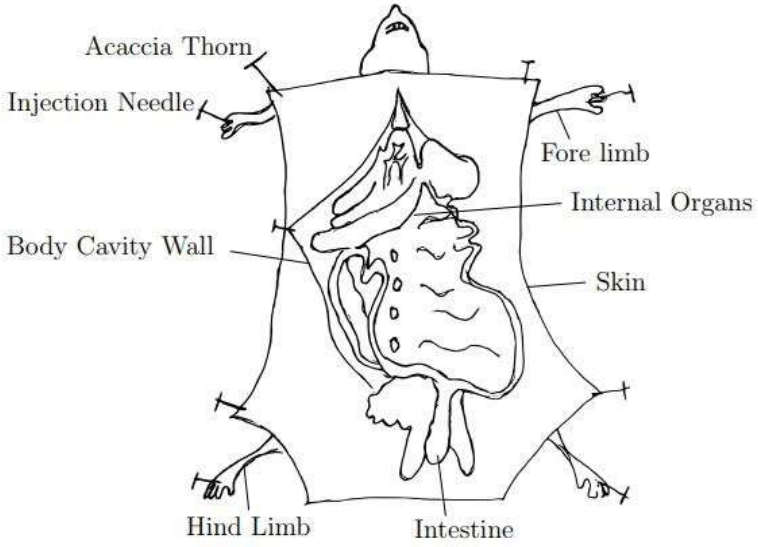
**Instructions**

1. This paper consists of three questions.

2. Answer all questions.

1. You are provided with specimen $S_1$. Dissect it to fully display the digestive and circulatory systems.

(a) Make a neat, well labelled drawing of your dissection.




(b) (i) Which part of the alimentary canal of specimen $S_1$ is specialized for water absorption?
Large intestine (colon)

(ii) How is the structure you named above adapted for the function it performs?
- Large surface area
- Presence of villi and microvilli
- Slow movement of contents to allow time for absorption
- Rich blood supply for transport of absorbed water

2. Solution A', B, C and D contain the same substance in varying concentrations.

(a) Label four test tubes as A, B, C and D. Place 10 $cm^3$ of each solution into their respective tubes.
(b) Add 2 drops of iodine solution to each test tube.
(c) Rinse mouth, chew rubber for 2 minutes.
(d) Collect 5 $cm^3$ of saliva in a beaker.
(e) Dilute saliva with 25 $cm^3$ of distilled water. Label as saliva solution.
(f) Add 1 $cm^3$ of saliva to tubes A, B and D. Do not shake.

(g) (i) Record time taken for blue colour to disappear.
Time varies depending on concentration. A disappears fastest if least concentrated.

(ii) What is the nature of the substance?
Starch

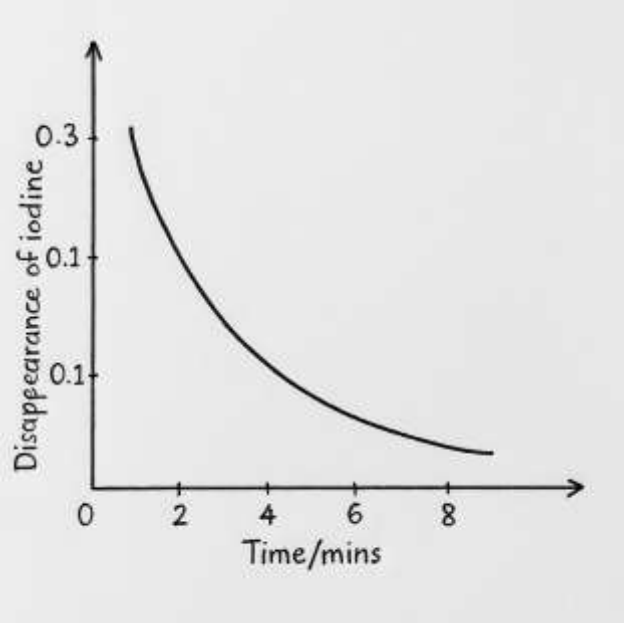
(iii) Why did the blue colour disappear in some test tubes?
Salivary amylase broke down starch into maltose, which does not form blue-black complex with iodine.

(iv) What investigation is being made in this experiment?
Effect of substrate concentration on the rate of starch digestion by salivary amylase.

(v) Which is the most concentrated solution?
C – Because its blue colour persists longest or doesn't disappear.

(vi) Which is the most dilute solution?
A – Because the blue colour disappears fastest.

(vii) What conclusions can you draw?
Higher starch concentration delays digestion rate; low concentration allows faster action of amylase.
(viii) Plot a sketch graph:
- X-axis: Time taken (s)
- Y-axis: Concentration of starch
Graph shows inverse relationship.

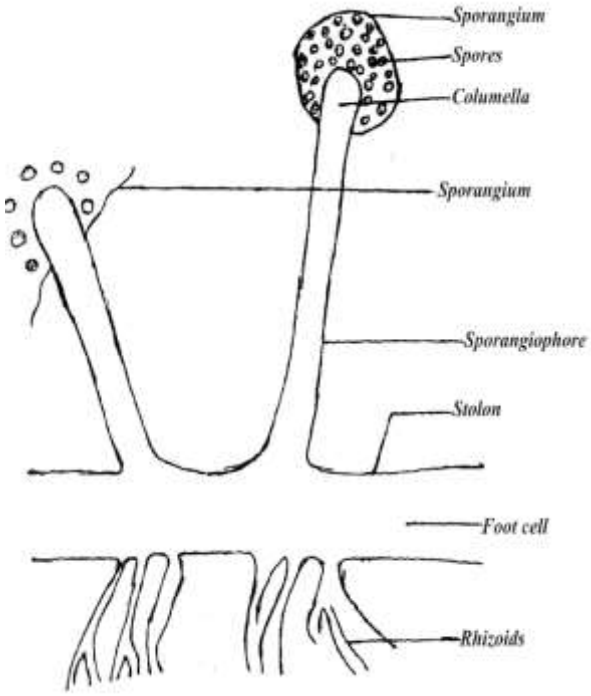



(ix) What is the purpose of the experiment in test tube C?
Serves as a control — no saliva added.

(x) Word equation:
Starch + Water -----> Maltose
(Enzyme: Salivary amylase)

3. (a) What is the common name of specimen $S_2$?
Rhizopus (bread mould)

(b) (i) Draw and label the structure concerned with asexual reproduction.
Label:




(ii) What specific reproductive role does the structure play?
Production and dispersal of asexual spores

4. Examine the external features of $S_3$ and $S_4$.

(i) Give the genus name:
$S_3$ -----> Musca
$S_4$ -----> Anopheles

(ii) Common name:
$S_3$ -----> Housefly
$S_4$ -----> Mosquito

(iii) Habitat of adults:
- Stagnant water surroundings
- Moist environments
- Homes or refuse areas

5. Using a hand lens, study $S_5$.

(i) To what subphylum does $S_5$ belong?
Pteridophyta (for ferns)

(ii) Reasons:
- Pinnate leaves
- Spores beneath leaves
- Absence of flowers and seeds
- Presence of sori

(iii) Draw and label one pinnule showing reproductive structures.

Label:
- Midrib
- Margin
- Sori
- Sporangia