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: 2020**

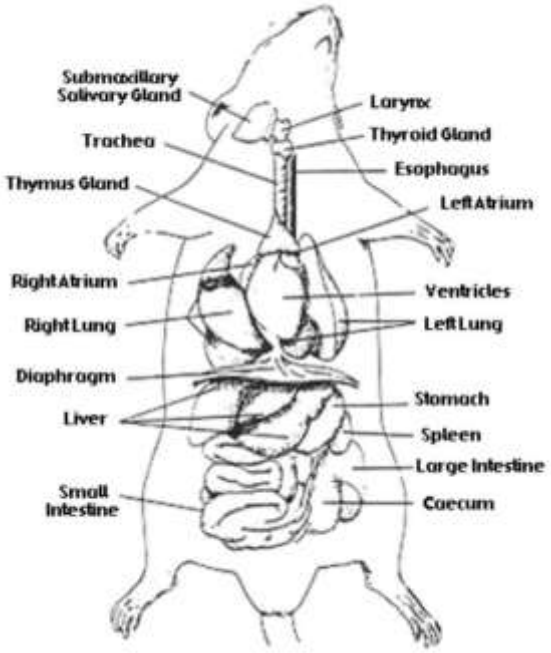
Instructions

1. This paper consists of three questions.

2. Answer all questions.

1. You have been provided with specimen J. Dissect the specimen in a usual way to fully display the digestive system. Pin out the ileum to your right hand side.

(a) Draw a large, neat diagram of your dissection and label nine parts.
Leave your dissection properly displayed for assessment.



(b) Use the hand lens to observe your dissection carefully.
(i) What is the name of a transparent ovoid sac structure lying between the main lobes of the liver in the specimen J?

Gall bladder

(ii) State the role of the structure named in 1(b)(i).
It stores and concentrates bile produced by the liver and releases it into the duodenum to aid fat digestion.

(iii) Enumerate three main digestive juices secreted into the duodenum.
Pancreatic juice
Intestinal juice
Bile

(c) (i) Identify two structures in the specimen J which are responsible for the storage of the excess absorbed food and state the food type stored in each structure.

Liver – stores glucose in the form of glycogen
Adipose tissue – stores excess lipids (fats)

(ii) What is the name of a ring muscle like the structure which is situated immediately between the far end of the stomach and the duodenum in specimen J?

Pyloric sphincter

(iii) State the role of the structure named in (c)(ii).

It controls the passage of partially digested food (chyme) from the stomach into the duodenum and prevents backflow.

2. You have been provided with solutions S_2 and S_3.

(a) Identify the food substances present in solutions S_2 and S_3 by using the chemicals and reagents provided. Tabulate your work as shown in Table 1:

Food Tested	Procedure	Observation	Inference
S_2 (Starch)	Add iodine solution	Blue-black color appears	Starch present
S_3 (Glucose)	Add Benedict's solution, heat	Brick-red precipitate forms	Reducing sugar present

(b) Explain the basis of each test which produced positive results in 2(a).

Iodine reacts with starch to form a blue-black complex, indicating presence of starch.
Benedict's solution reacts with reducing sugars under heat, producing a brick-red precipitate, indicating reducing sugar is present.

(c) An excess of one food substance identified in 2(a) is stored in the body.
(i) Identify the food.

Glucose

(ii) Name the hormone which influences the conversion of food substance to a form that can be stored, and the organ which produces the hormone.

Hormone – Insulin
Organ – Pancreas

(iii) State the form relevant for storage.

Glycogen

3. You have been provided with specimens L, M, N and P.

(a)(i) State two adaptations shown by each of the specimens L and M to its habitat.

L (e.g. amphibian):
- Moist skin for gaseous exchange
- Webbed feet for swimming

M (e.g. reptile):
- Scaly skin to prevent water loss
- Clawed toes for burrowing or climbing

(ii) Classify the specimens L and M to Class level.

L – Amphibia
M – Reptilia

(b) Why scientists formalized the placement of specimens L and N in the same Kingdom? Give four points.

They are both multicellular.
They are heterotrophic (consume organic food).
They exhibit locomotion at some stage of life.
They have organized organ systems.

(c) Construct a bracketed key for identification of the specimens L, M, N and P using the following features:
(i) Body differentiation
(ii) Leaves with sori
(iii) Leaves with veins

1a Body differentiated into root, stem, and leaves – Go to 2
1b Body not differentiated – N (e.g. Alga)

2a Leaves have sori (spore-producing structures) – P (e.g. Fern)
2b Leaves have veins – Go to 3

3a Broad leaves with net-like veins – L (e.g. dicot plant)
3b Narrow leaves with parallel veins – M (e.g. monocot plant)