THE UNITED REPUBLIC OF TANZANIA
NATIONAL EXAMINATIONS COUNCIL OF TANZANIA
DIPLOMA IN SECONDARY EDUCATTION EXAMINATION

733/2B **BIOLOGY 2B**

Time: 3 Hours **ANSWERS** **Year: 2023**

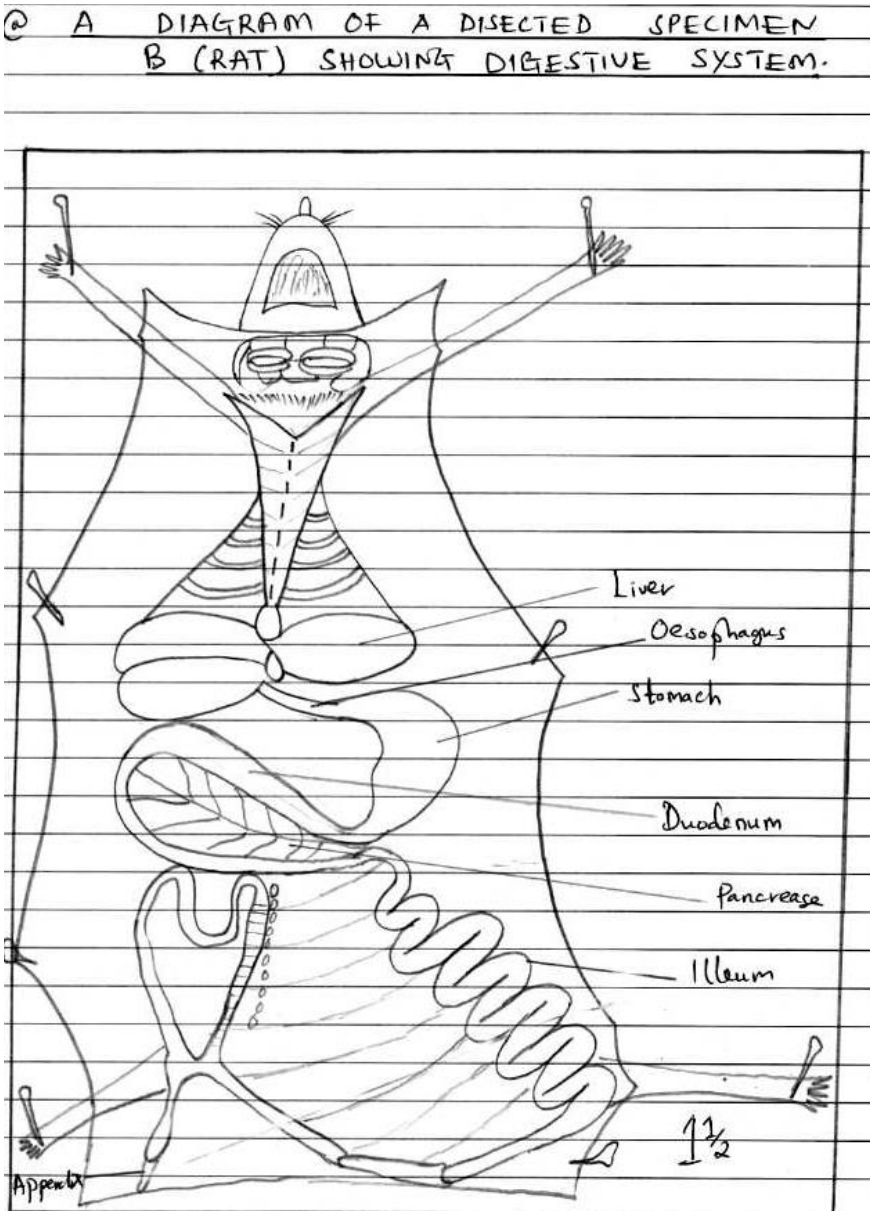
Instructions.

1. This paper consists of **three (3)** questions
2. Answer **all** questions.
3. Question **one (1)** carries **twenty (20)** marks and the remaining carry **fifteen (15)** marks each.
4. Cellular phones are **note** allowed in the examination room.
5. Write your **examination Number** on every page of your answer booklet(s).

1. Dissect the provided specimen B in the usual way and display the digestive system.
Deflect the alimentary canal to the left-hand side of the specimen and respond to the following questions: -

(a) Draw a diagram of a dissected specimen B and label six parts that forms the digestive system.
(b) Carefully observe the dissected specimen B by using hand lens and identify the structure that carry out each of the following functions:
(i) Transfer of food from mouth to the stomach
(ii) Production of ptyalin enzyme
(iii) Secretion of bile.
(c) Does specimen B have a gall bladder or not? Give a reason for your response.

(a) Draw a diagram of a dissected specimen B and label six parts that forms the digestive system.



(b) Carefully observe the dissected specimen B by using hand lens and identify the structure that carry out each of the following functions:

(i) Transfer of food from mouth to the stomach **Oesophagus**

(ii) Production of ptyalin enzyme **Mouth(Salivary gland)**

(iii) Secretion of bile.**Liver**

(c) Does specimen B have a gall bladder or not? Give a reason for your response.

Specimen B have gall bladder since it have liver which secrets bile and the bile is stored in the gall bladder.

2. You are provided with specimen D. Carry out an experiment using the following procedures:

Procedures

(a) Cut the specimen D into two halves.

(b) Place one half into a mortar and grind using pestle to make a paste

(c) Place the paste into the test tube and label it as test tube X.

(d) Place the other half into another test tube and label it as test tube Y

(e) Add 2mls of 2% H_2O_2 solution into each of the test tube X and Y and note the changes.

(f) Take a wooden splint and test the evolution of gas in each of the test tubes. Record your observation.

Questions

(a) (i) What was the aim of this experiment?

to investigate an enzyme activity

(ii) Which test tube acted as a control experiment?

the test tube which acted as a control was test tube X

(b) Why was specimen D grounded?

to increase the surface area of the substrate in order to increase the rate of reaction

(c) (i) What did you observe after adding 2% hydrogen peroxide solution into each of the test tube X and Y? Give reason for each observation.

- **in test tube X, there was evolution of strong effervescence which appeared as bubbles of air because in the grounded specimen D, more catalase enzymes were exposed to 2% hydrogen peroxide leading to high rate of reaction which was indicated by high production of effervescence**
- **in the test tube Y, there was less evolution of effervescence. That was because in the ungrounded specimen D, a few catalase enzymes were exposed causing low rate of reaction which was indicated by low production of effervescence**

(ii) Suggest the name of the substance contained in specimen D which was responsible for the changes noted in one of the test tubes in procedure(e).

catalase enzyme

(iii) Write the chemical equation for the reaction which occurred after adding 2 % of hydrogen peroxide solution which caused the observed changes in one of the test tube in procedure (e).

$$2H_2O_2 \xrightarrow{\text{catalyst}} 2H_2O + O_2$$

(d) Name the gas evolved in this experiment. Give reasons for your answer.

- **the gas evolved is oxygen with reasons that the gas relit a glowing wooden splint in test tube X.**

(e) What deductions can be made in this experiment? Give two points.

- **enzyme activity depends on their concentrations. The higher the concentration of enzymes, the higher the rate of reaction and vice versa. This explains why there was more effervescence in test tube X than Y.**

3. provided with specimens A, F, C, G, and E. They were required to observe them carefully and answer the following questions:

(a) What are the observable features shared by specimen C and E? Give five points.

(b) How is specimen F important for industrial development? Give four points.

(c) Observe the lower surface of the specimen A and answer the following questions.

(i)Identify the structures found on the lower side.

(ii)What is the function of the structure identified in (c)(i)?

(d) What are the observable features used to place specimen C, G and E to their phylum? Give three points.

ANSWERS

(a) Observable features shared by specimen C (Butterfly) and E (Beetles):
First, both specimens have a segmented body divided into three main parts: head, thorax, and abdomen.

Second, both possess three pairs of jointed legs attached to the thorax, which is a characteristic of insects. Third, they each have one or two pairs of wings attached to the thorax region, enabling them to fly.

Fourth, both have a pair of compound eyes which help in detecting movement and vision over a wide angle.

Fifth, both bodies are covered by a hard outer covering known as an exoskeleton made of chitin, providing protection and structural support.

(b) Importance of specimen F (Animal skin) for industrial development:
One, animal skin is processed to produce leather, which is used in making shoes, belts, wallets, and other leather products, supporting the leather industry.

Two, it provides raw material for furniture upholstery, car seats, and clothing, contributing to manufacturing and fashion industries.

Three, animal skin is used in the production of drums and traditional musical instruments in cultural and entertainment industries.

Four, processed animal skin yields gelatin, which is used in the food industry, pharmaceuticals, and photography.

(c) Observation of the lower surface of specimen A (Fern plant):

(i) The structures found on the lower side of the fern leaves are called **sporangia**, often grouped in clusters called **sori**.

(ii) The function of the sporangia is to produce and release spores for reproduction. These spores, once released, can grow into new fern plants under suitable conditions.

(d) Observable features used to place specimens C (Butterfly), G (Grasshopper), and E (Beetles) to their phylum (Arthropoda):

First, all these specimens have a segmented body divided into head, thorax, and abdomen, a key feature of arthropods.

Second, they possess jointed appendages, such as legs and antennae, which allow for movement and sensory functions.

Third, all have an external skeleton, known as an exoskeleton, made of chitin that protects their body and provides structural support.