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

733/2A **BIOLOGY 2**

(PRACTICAL 2A)

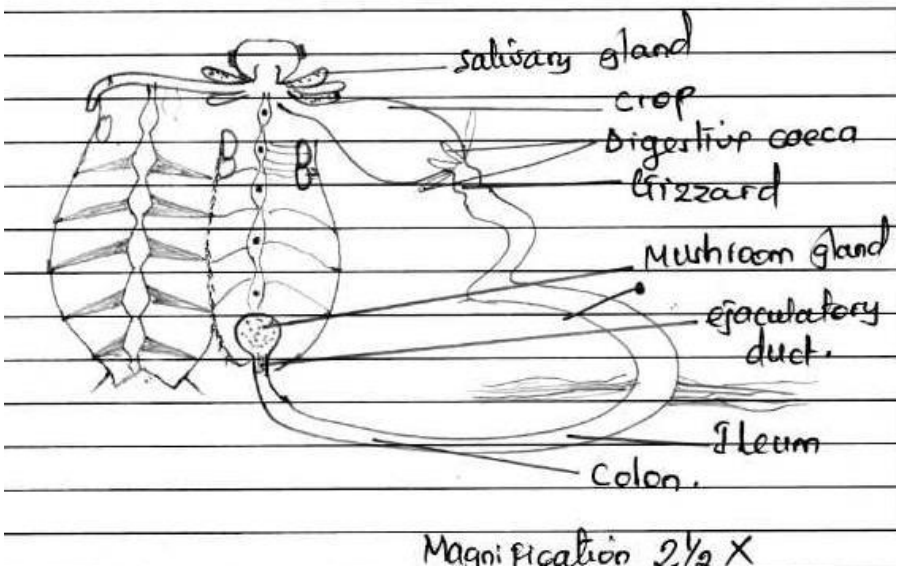
Time: 3 Hours **ANSWERS** **Year: 2024**

Instructions.

1. This paper consists of sections **three** questions.
2. Answer **all** questions.
3. Cellular phones are **note** allowed in the examination room.
4. Write your **examination Number** on every page of your answer booklet(s).

1. Dissect the provided specimen T in the usual way and display the digestive and reproductive system. Then, respond to the following questions: -

   (a) Draw a well labelled diagram of the dissected specimen T to show six parts that form the digestive system and two parts that form the reproductive system.



   (b) Study the digestive system of specimen T carefully and name three major parts that form the alimentary canal.
   (i) Fore gut
   (ii) Midgut
   (iii) Hindgut

2. Provided with specimen E_1 and E_2 and required to carry out an experiment using the following procedures:
   (i) Cut the specimen E1 into two halves using scalpel/sharp knife.
   (ii) Put 2 drops of iodine solution on the surface of one half and leave it for five minutes then observe the colour changes
   (iii) Put two drop of Benedicts' solution on the surface of another half. Leave it for five minutes then observe the colour change.
   (iv) Remove the outer cover from the specimen E_1.
   (v) Rub the opened specimen E_2 on a plain paper provided for some times then dry using an open flame and observe the changes.

   Questions

   (a) (i) What was the colour change after adding 2 drops of iodine solution on the surface of specimen E1?

   When two drops of iodine solution were added to the cut surface of specimen E1 (Irish potato), the colour changed from brownish-yellow to blue-black.

(b) (ii) Identify the food substances contained in specimen E1.

The food substance present in specimen E1 is starch.

(c) (iii) State the basis for the test which led to the colour change.

The basis for the test is that iodine solution reacts chemically with starch to form a blue-black complex. This indicates the presence of starch in the tested material.

(d) Identify the enzyme responsible for digestion of the food substance identified from specimen E1 and state its end product of digestion.

The enzyme responsible for digesting starch is amylase.
The end product of starch digestion is glucose.

(e) What is the role of the food substance identified in part (a)(ii) in the plant body? Give four points.

The starch in the plant body serves as an energy storage compound. It is synthesized from glucose during photosynthesis and stored for future use.

It acts as a reserve food material that the plant can break down into glucose when energy is needed for cellular processes such as respiration.

It contributes to osmotic balance within plant cells by reducing the osmotic pressure when converted from soluble glucose into insoluble starch.

It helps in seed development and germination by supplying energy to the growing embryo once seeds start sprouting.

(f) State two functions of the food substance contained in E2 to animals living in semiarid regions.

The food substance in specimen E2 (crystal seed, which typically contains oils/lipids) serves as a high energy reserve, providing more energy per gram than carbohydrates or proteins, which is crucial for survival in harsh, food-scarce conditions.

It helps in reducing water loss since oxidation of fats during metabolism releases metabolic water, which is vital for animals in dry, semiarid environments.

3. You are provided with specimens A, B and C and specimen D then carefully observe each specimen and answer the following questions:

(a) State five observable features which differentiate specimen A (Bird) and specimen D (Mice)

The body of specimen A is covered with feathers, while specimen D is covered with fur or hair.

Specimen A has a beak used for feeding, while specimen D has teeth for chewing and biting food.

Specimen A has wings adapted for flying, while specimen D has forelimbs and hind limbs adapted for running and walking.

The external ears (pinnae) are absent in specimen A, while specimen D has clearly visible external ears.

Specimen A lays eggs as a means of reproduction (oviparous), while specimen D gives birth to live young ones (viviparous).

(b) What are the three common observable features which are found in specimen B (Grasshopper) and specimen C (Cockroach)?

Both specimen B and C have a segmented body divided into head, thorax, and abdomen.

Both have jointed legs attached to the thorax, with three pairs of legs visible.

Both possess a pair of antennae on the head used for sensing their environment.

(c) Draw a diagram of specimen B (Grasshopper) and label five parts