THE UNITED REPUBLIC OF TANZANIA

NATIONAL EXAMINATION COUNCIL

DIPLOMA IN SECONDARY EDUCATION EXAMINATION

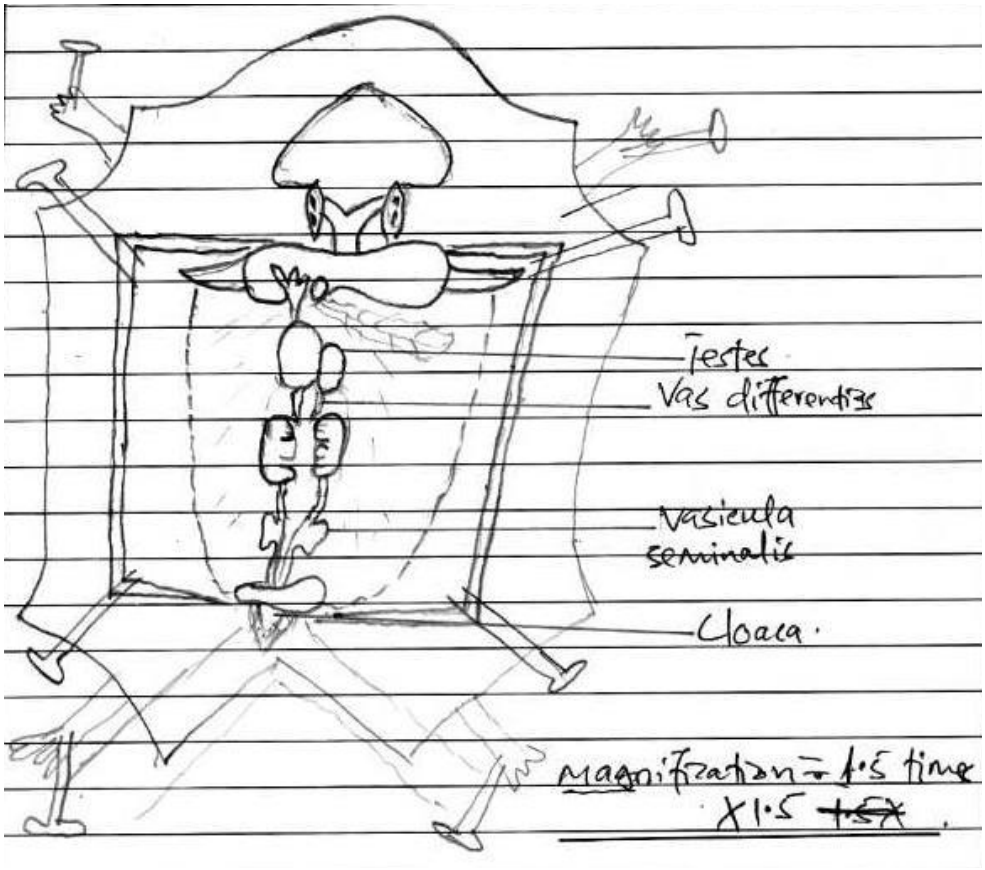
733/2B **BIOLOGY 2B**

Time: 3 Hour. **ANSWERS** **Year: 2017**

Instructions

1. This paper has three papers.
2. Answer **all** questions.
3. Question **1** contains 30 marks while question 2 and 3 have 10 marks each.
4. Mobile phones are not allowed inside the examination room.
5. Write your Examination Number on every page of your answer booklet.

1. Dissect the provided specimen Y (toad or frog) to display the reproductive system.
(a) Draw a well-labelled diagram of the reproductive system showing four parts.



(b) Identify the organs responsible for:
(i) Production of gametes
The testes in males are responsible for producing sperm, while the ovaries in females produce eggs (ova).

(ii) Temporary storage of gametes
In males, the sperm are temporarily stored in the seminal vesicles or parts of the vas deferens before being released.

(iii) Transportation of gametes
In males, the vas deferens transport sperm from the testes to the cloaca. In females, the oviducts transport eggs from the ovaries to the cloaca or external environment.

(c) What will happen if the anterior abdominal vein is punctured during dissection?

Puncturing the anterior abdominal vein will lead to excessive bleeding within the body cavity, obscuring visibility of internal organs and possibly damaging the integrity of the structures being studied. It may also cause the death of the specimen if done on a live animal.

(d) Give two reasons why water should be flooded into the body cavity after opening.

Flooding the body cavity with water helps to keep internal organs moist, preventing them from drying and sticking together, which can obscure visibility during dissection.

Water also helps to gently separate and spread out the organs for easier identification and clearer observation during practical work.

2. You are given solution T.
(a) Perform biochemical food tests on solution T using provided reagents. Record your findings in a table:

Food Tested	Procedure	Observation	Inference
Starch	Add iodine solution	Blue-black colour	Starch present
Protein	Add Biuret solution	Purple colour	Protein present
Reducing Sugar	Add Benedict's solution and heat	Brick-red precipitate	Reducing sugar present
Lipids	Rub on paper and heat	Translucent spot	Lipids present

(b) Name two food sources from which solution T might have been extracted.

Solution T could have been extracted from groundnut paste, which contains proteins, lipids, and some carbohydrates.

It could also be from milk, which contains proteins, reducing sugars (like lactose), and lipids.

(c) Mention the first site of digestion, digestive juice involved, and end products for each identified food substance.

Starch digestion begins in the mouth with the help of saliva, which contains salivary amylase. It is broken down into maltose and then glucose.

Proteins begin digestion in the stomach through gastric juice, which contains pepsin. The end products are polypeptides and then amino acids.

Reducing sugars like glucose do not require digestion but are absorbed directly in the small intestine.

Lipids are first emulsified in the small intestine by bile, then digested by pancreatic lipase into fatty acids and glycerol.

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3. Observe specimens A (Spider), B (Butterfly), C (Fern), D (Mushroom), and E (Maize).
(a) Use four observable features to differentiate between:
(i) Specimen A and B

The spider has four pairs of legs (8 legs total), while the butterfly has three pairs of legs (6 legs total).

Specimen A has no antennae, but specimen B has a pair of prominent antennae.

The spider has a two-part body: cephalothorax and abdomen. The butterfly has a three-part body: head, thorax, and abdomen.

Spiders have simple eyes and no wings, while butterflies have compound eyes and two pairs of wings.

(ii) Specimen C and E

The fern reproduces via spores and lacks flowers and seeds, while maize reproduces using seeds and has flowers.

Fern leaves (fronds) show coiled young leaves (circinate vernation), whereas maize has broad, flat leaves with parallel veins.

Ferns have rhizomes for underground stems, while maize has a true upright stem and fibrous roots.

(b) Draw a labelled diagram of specimen D showing four visible parts.