THE UNITED REPUBLIC OF TANZANIA

NATIONAL EXAMINATIONS COUNCIL

ADVANCED CERTIFICATE OF SECONDARY EDUCATION EXAMINATION

133/3B **BIOLOGY 3B**

(ACTUAL PRACTICAL B)

(For Both School and Private Candidates)

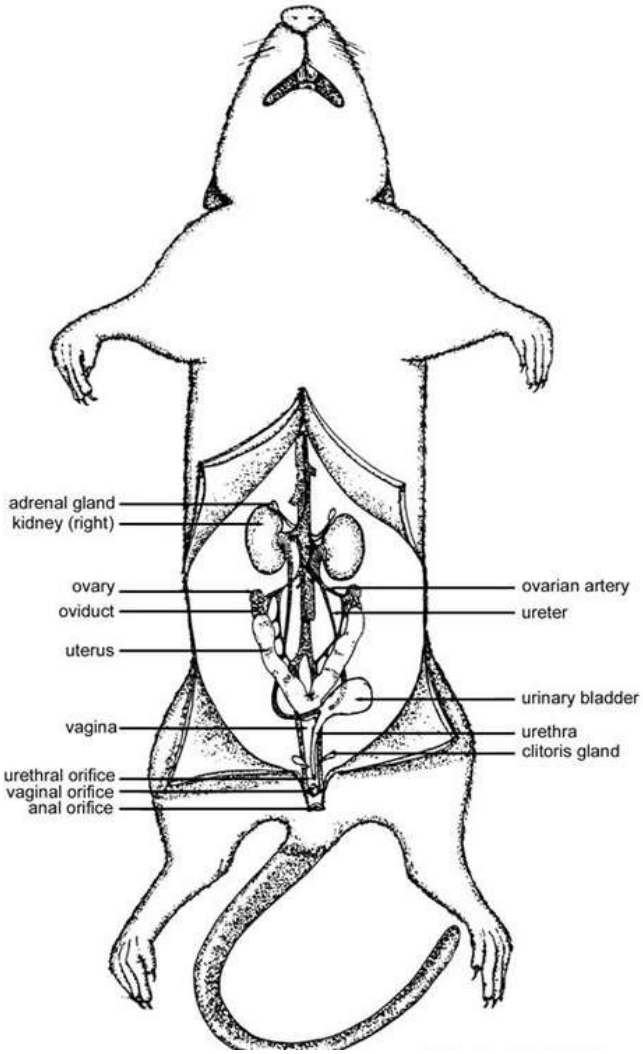
Time: 2:30 Hours **ANSWERS** **Year: 2013**

Instructions

1. This paper consists of three questions.

2. Answer all questions.

1. (a) Dissect specimen S_1 provided and display the Urogenital system.
Draw a large, neat, well labelled diagram of your dissection.
Leave your dissection properly displayed for assessment.



(b) Comment on the shape of the kidneys in specimen S_1 as compared to that of other animals such as amphibians.

In specimen S_1 (likely a mammal), the kidneys are bean-shaped and compact, while in amphibians they are elongated and lobed.

(c) Observe the left kidney of the specimen. Without disturbing it in any way, draw a large labelled diagram to show the side view of the kidney.

Diagram should include:

- Cortex
- Medulla
- Pelvis
- Ureter
- Renal artery and vein

(d) Comment on the positions of the testis/ovaries in S_1 as compared with other animals like amphibians.

In specimen S_1, testes/ovaries are located in the abdominal cavity close to the kidneys, while in amphibians, they are usually more internal and less externally visible.

2. Solution R is a mixture of different food substances. Design and carry out an experiment to identify the type of food substances present in solution R using the reagents provided.

(a) Record your work in the usual tabular form:

Food Tested	Procedure	Observation	Inference
Solution R	Add Benedict's solution, heat	Brick-red precipitate	Reducing sugar present
Solution R	Add iodine solution	Blue-black color	Starch present
Solution R	Add Biuret reagent	Purple coloration	Protein present
Solution R	Add ethanol and shake with water	Emulsion appears	Lipid present

(b) Which food substance identified in solution R is stored in the plant body?

Starch

(c)(i) Name the end products of the food substance mentioned in 2(b) after its digestion.
Glucose

(ii) What are the roles of the food substances identified in 2(a) in the human body?

- Reducing sugar (glucose) -----> Provides quick energy
- Starch -----> Source of long-term energy (after conversion)
- Protein -----> Builds and repairs body tissues
- Lipid -----> Source of energy and component of cell membranes

3. (a) Using the key provided, identify specimen S_2 by gradually writing the numbers corresponding to the positive statements until you come to the appropriate group name.

Follow the key:
1(b) -----> 2(b) -----> 3(b) -----> 4(a) -----> 5(a) -----> 6(a) -----> 7(a) -----> 8(b)
Specimen S_2 belongs to Sterculiaceae

(b) Write the floral formula of specimen S_2.

Floral formula:
Actinomorphic, bisexual
K(5) C(5) A(5-15) G(1) superior

(c) Use the hand lens to observe specimens S_3 and S_5 carefully, then answer the questions that follow:

(i) How is specimen S_3 adapted to pollinate specimen S_2?

Specimen S_3 (likely an insect or bird) has a proboscis or mouthparts long enough to reach the nectar and pollen of S_2. It may also have body parts that come into contact with anthers and stigma during feeding.

(ii) State one observable adaptive feature which makes each pollen grain suitable for the method of pollination in specimen S_2.
Pollen grains may have sticky surfaces or spiny projections to attach to pollinators.

(d) State how specimen S_5 is adapted to its function.

Specimen S_5 (likely stigma or ovary):
- Sticky surface or feathery structure to trap pollen grains efficiently
- Located at a strategic height or position to intercept pollen from wind or pollinators