THE UNITED REPUBLIC OF TANZANIA

NATIONAL EXAMINATIONS COUNCIL

CERTIFICATE OF SECONDARY EDUCATION EXAMINATION

033/2B **BIOLOGY 2B**

(ACTUAL PRACTICAL B)

(For Both School and Private Candidates)

Time: 2:30 Hours **ANSWERS** **Year: 2011**

Instructions

1. This paper consists of two questions.

2. Answer all questions.

1. Solution D contains different food substances:

(a) Using the chemicals and reagents provided, carry out food test to identify the food substance present in solution D. Tabulate your work as shown in the following Table:

Food tested: Starch
Procedure: Add iodine solution to solution D
Observation: Blue-black coloration
Inference: Starch is present

Food tested: Reducing sugar
Procedure: Add Benedict's solution to solution D and heat in a water bath
Observation: Brick-red precipitate
Inference: Reducing sugar is present

Food tested: Protein
Procedure: Add Biuret solution to solution D and shake gently
Observation: Purple coloration
Inference: Protein is present

Food tested: Lipid
Procedure: Mix solution D with ethanol, shake, then add water
Observation: Milky white emulsion
Inference: Lipid is present

(b) For each food substance identified in 1(a) above, name the end product after digestion.
Starch: Glucose
Reducing sugar: Glucose
Protein: Amino acids
Lipid: Fatty acids and glycerol

(c) From the food substances identified in 1(a) above, which one must be excreted out of the body by the kidney when it is in excess?
The end product of protein (amino acids) must be excreted when in excess, because the liver converts them to urea, which is removed by the kidneys.

(d) Briefly explain what would happen when excess food named above is allowed to accumulate in the body.
When excess protein (or its end products) accumulate, it leads to buildup of urea in the blood, causing a condition known as uremia. This can lead to kidney failure and toxicity that affects the entire body system.

2. You have been provided with specimens G_1, G_2, G_3, G_4, and G_5.

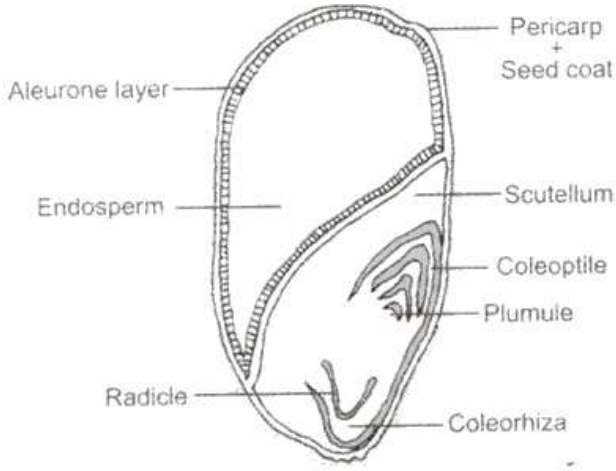
(a) Using a hand lens, carefully study the specimens then:

(i) Identify each specimen by its common name.
G_1: Termite
G_2: Maize seed
G_3: Bean seed
G_4: Taproot
G_5: Fibrous root

(ii) Classify G_1 and G_5 to class level.
G_1: Class Insecta
G_5: Class Monocotyledonae

(iii) State two economic importance of specimen G_2.
- Maize is a staple food in many regions and provides carbohydrates for energy.
- It is used as animal feed and also serves as raw material in industries for producing starch, oil, and alcoholic beverages.

(iv) Draw a well labeled diagram of specimen G_2.



(b) (i) State two differences between G_4 and G_5.
G_4 (taproot) has a single main root with lateral branches, while G_5 (fibrous root) has many roots of similar size.
G_4 penetrates deeply into the soil, while G_5 spreads widely near the surface.

(ii) State two similarities between specimen G_4 and G_5.
Both anchor the plant in the soil.
Both absorb water and mineral salts from the soil to support plant growth.