THE UNITED REPUBLIC OF TANZANIA

NATIONAL EXAMINATIONS COUNCIL

CERTIFICATE OF SECONDARY EDUCATION EXAMINATION

033/2A **BIOLOGY 2A**

(ACTUAL PRACTICAL A)

(For Both School and Private Candidates)

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

Instructions

1. This paper consists of two questions.

2. Answer all questions.

.1(a) Identify the food substances present in solution B by using the reagents provided. Tabulate your work as shown in the following table:

Food tested: Starch
Procedure: Add a few drops of iodine solution to solution B
Observation: A blue-black coloration appears
Inference: Starch is present

Food tested: Reducing sugars
Procedure: Add Benedict's solution and heat the mixture in a water bath
Observation: A brick-red precipitate forms
Inference: Reducing sugars are present

Food tested: Protein
Procedure: Add Biuret solution to solution B and shake gently
Observation: A violet or purple coloration appears
Inference: Protein is present

Food tested: Lipids (fats and oils)
Procedure: Add ethanol to solution B, shake, then add water
Observation: A milky white emulsion appears
Inference: Lipids are present

1(b)(i) For each food substance identified in 1(a), name two common sources:

Starch: Maize, potatoes
Reducing sugars: Honey, ripe bananas
Protein: Eggs, beans
Lipids: Groundnuts, sunflower seeds

1(b)(ii) State their role in the body of a human being:

Starch: Provides long-term energy as it is broken down into glucose
Reducing sugars: Provide quick energy due to rapid absorption and metabolism
Protein: Supports growth, tissue repair, and enzyme production
Lipids: Store energy, insulate the body, and form cell membranes

1(c)(i) The digestion of one of the identified food substances in 1(a) starts in the mouth. Name this food substance:

The food substance is starch.

1(c)(ii) Identify the enzyme responsible for its digestion in the mouth:

The enzyme is salivary amylase (also called ptyalin), which breaks starch into maltose.

1(d)(i) Name the part of the digestive system in which most of digestion and absorption of food takes place:

The small intestine (particularly the duodenum for digestion and ileum for absorption).

1(d)(ii) Explain how the named part in 1(d)(i) is adapted for absorption of digested food substances:

The small intestine is long and coiled to increase surface area for absorption. It contains numerous villi and microvilli that further increase the surface area. The walls of villi are thin to allow quick diffusion of nutrients into blood capillaries. It is richly supplied with blood vessels to transport absorbed nutrients efficiently.

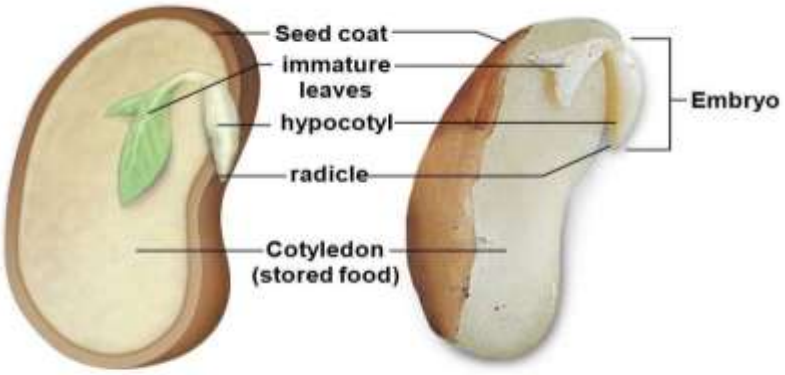
2(a)(i) Identify specimen S_1, S_2, S_3 and S_4 by their common names:

S_1: Termite
S_2: Earthworm
S_3: Bean seed
S_4: Moss plant

2(a)(ii) Classify specimen S_1, S_2 and S_3 to Class level:

S_1 (Termite): Class Insecta
S_2 (Earthworm): Class Oligochaeta
S_3 (Bean seed): Class Dicotyledonae

2(b)(i) Draw a neat, large and well-labeled diagram of specimen S_3:



2(b)(ii) State the habitat of specimen S_3:

Specimen S_3 (bean seed) grows in soil, usually in well-drained, moderately moist environments.

2(b)(iii) In what ways is specimen S_3 important to a farmer?

Bean seeds are important to farmers as they serve as a source of food rich in protein. They also help in soil nitrogen fixation when grown as legumes, improving soil fertility. Additionally, they provide income through sale and can be used for crop rotation practices.

2(c) State two advantages of specimen S_1:

Specimen S_1 (termite) helps in decomposing organic matter, enriching soil fertility. Some species also serve as a food source rich in protein.

2(d) State four advantages of specimen S_4:

Specimen S_4 (moss) helps retain soil moisture by covering the ground. It prevents erosion, contributes to soil formation, and serves as habitat for small organisms. Some moss species are used in horticulture and medicine.

2(e) Give reason why specimen S_4 was formally placed in the Kingdom Plantae:

Specimen S_4 was placed in Kingdom Plantae because it carries out photosynthesis, has cell walls made of cellulose, stores food as starch, and grows in moist terrestrial environments similar to other plants.