THE UNITED REPUBLIC OF TANZANIA

NATIONAL EXAMINATIONS COUNCIL

ADVANCED CERTIFICATE OF SECONDARY EDUCATION EXAMINATION

155/3 **FOOD AND HUMAN NUTRITION 3**

(For Both School and Private Candidates)

Time : 3 Hours **Year: 2009**

Instructions

1. This paper consists of sections **three (3)** questions.
2. Answer all questions.
3. Question **one (1)** carries **twenty (20)** marks and question **two (2)** and **three (3)** carries **fifteen (15)** marks each.
4. Communication devices and any unauthorised materials are **not** allowed in the examination room.
5. Write your **Examination Number** on every page of your answer booklet(s).

1. You are provided with **cassava flour**. You are required to perform the experiment by following the given procedures I to VII.

Procedure I

Place 25 g of cassava flour and 15 ml of clean tap water in a small bowl and mix thoroughly.

Procedure II

Knead the mixture by hand for 5 minutes. Add a little more flour if the mixture is too wet and a little more water if it is tough and crumbly. Observe the characteristics of the mixture and give explanations.

Procedure III

Knead the mixture until a smooth ball of dough that springs back to the touch is obtained.

Procedure IV

Cover the dough with clean tap water and soak it for 10 minutes.

Procedure V

Work on the dough using fingers. Pour some of the washing water into a clean beaker and allow it to stand for 15 minutes while observing. Record your observations and give explanations.

Procedure VI

Replace with fresh water, discarding the washing water, until a more elastic substance Q is formed during the washing process. Strain the washing water to collect scattered pieces of substance Q. Observe the colour of the water and give explanations.

Procedure VII

Place substance Q in a petri dish and identify it.

Questions

(a) Briefly explain two other factors that could have resulted in the characteristics of the mixture observed in Procedure II.

(b) Why was the dough soaked in water in Procedure IV?

(c) Briefly explain:

(i) What happened when cassava flour and water were mixed and kneaded.

(ii) The role of starch in the baking process.

(iii) The purpose of forming substance Q in the baking process.

2. You are provided with fresh goat milk, vinegar, concentrated nitric acid (HNO3), lime water, ammonium solution, and red litmus paper. Perform three experiments by following the procedures given under each experiment. Record observations and provide explanations.

Procedure A

(i) Place 20 ml of milk into a clean, dry test tube.

(ii) Add 2 ml of vinegar and allow the mixture to stand for 5 minutes. Write observations and give explanations.

(iii) Separate the contents of the mixture.

Questions

(a) Identify the components of milk obtained after adding vinegar and standing for 5 minutes.

(b) Identify the nature of vinegar as a food sample.

Procedure B

Divide the fluid portion of the mixture obtained in Procedure A into two equal portions, then:

(i) Heat one portion in a porcelain dish over a flame. Record observations on changes.

(ii) Evaporate the other portion almost to dryness in a water bath, allow to cool, and observe the odour and taste of the residue.

Question

Explain what Procedure B demonstrates, giving two points.

Procedure C

Dry the thick substance obtained in Procedure A on filter paper and divide it into three equal portions:

(i) Place one portion on a porcelain dish and heat it on a flame. Observe the odour of the fumes and give explanations.

(ii) Place the second portion into a dry test tube, cover it with 10% lime water, and gently warm. Observe the odour and test with moist red litmus paper. Record observations.

(iii) Place the third portion in a dry test tube, carefully cover with concentrated nitric acid, heat to boil while observing, cool under running water, and slowly add ammonium solution. Record observations.

Question

Explain what steps (ii) and (iii) demonstrate.

3. You are provided with **sample P (taro root)** and **iodine solution**. Perform the experiment by following Procedures I to V. Record observations and provide inferences.

Procedures:

(i) Peel, wash, and cut the food sample into two equal pieces using a clean knife.

(ii) Place one piece in a clean petri dish and cook the other piece in boiling water for 15 minutes.

(iii) Remove the boiled piece, place it in another petri dish, observe its odour, and record observations with explanations.

(iv) Mash both pieces using a teaspoon. Record observations and give explanations.

(v) Half-fill a test tube with the water used to boil the sample and add a few drops of iodine solution. Record your observation and give explanations.