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: 2001**

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 maize flour, tap water, iodine solution, and clean bowls. Carry out the experiment as follows:

   (i) Place 20 g of maize flour into a beaker, add 40 ml of boiling water, stir to form a paste, and cool.

   (ii) Divide the paste into two portions. Add a few drops of iodine to one portion. Record observations.

   (iii) Take the other portion, add 10 ml of dilute hydrochloric acid, and heat gently for 5 minutes. Cool, then neutralize with dilute sodium hydroxide. Add Benedict's solution and heat. Record observations.

   Questions:

   (a) What is demonstrated in step (ii)?

   (b) Explain the chemical changes taking place in step (iii).

   (c) State the importance of the reaction in step (iii) in human digestion.

2. You are provided with milk, vinegar (acetic acid), and lime water. Perform the following:

   (i) Put 20 ml of milk into a beaker and add 5 ml of vinegar. Allow it to stand for 10 minutes. Record observations.

   (ii) Filter the mixture and collect both the residue and filtrate.

   (iii) Heat the residue gently on a porcelain dish. Record odour and colour changes.

   (iv) To the filtrate, add 5 ml of lime water and shake. Record observations.

   Questions:

   (a) Identify the residue obtained in step (ii).

   (b) What does step (iii) demonstrate?

   (c) Explain the observation in step (iv).

   (d) State two practical applications of this experiment in food processing.

3. You are provided with cooking oil, sodium hydroxide solution, phenolphthalein, and ethanol. Perform the following:

   (i) Place 5 ml of cooking oil in a test tube and add 5 ml of ethanol. Shake thoroughly.

(ii) Add 10 ml of sodium hydroxide solution and boil gently for 5 minutes. Allow to cool.

(iii) Add a few drops of phenolphthalein to the cooled mixture. Record observations.

Questions:

(a) What process is demonstrated in this experiment?

(b) Explain the importance of the process in food and non-food industries.

(c) State one other method used to test the quality of fats and oils.