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: 2005**

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 wheat flour, water, and iodine solution. Perform the following experiments:

   (a) Mix 50 g of wheat flour with 30 ml of water and knead to form dough. Observe and describe the texture.

   (b) Wash the dough under running water to separate starch from gluten. Collect the gluten and starch separately.

   (c) Test the starch with iodine solution and record the colour change.

   (d) Test the gluten for protein using the Biuret test and describe your observation.

   (e) Explain scientifically:

   i. Why starch turns blue-black with iodine.

   ii. The functional role of gluten in bread making.

2. You are given fresh egg, lemon juice, and boiling water. Conduct the following:

   (a) Beat one egg white and divide it into two portions.

   (b) Heat the first portion over a water bath and note the changes.

   (c) Add lemon juice to the second portion and expose it to air for 5 minutes. Record any colour or texture changes.

   (d) Explain the effect of heat and acid on egg white proteins.

   (e) Discuss one practical application of protein denaturation in food processing.

3. You are provided with cooking oil, NaOH solution, and phenolphthalein indicator. Perform the following:

   (a) Weigh 10 g of the oil and add 50 ml of alcohol containing 1 ml of NaOH solution. Heat gently and stir.

   (b) Observe and record any changes.

   (c) Determine the presence of free fatty acids by adding a few drops of phenolphthalein. Note the colour change.

   (d) Explain the significance of free fatty acid determination in assessing oil quality.