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: 2014**

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 food samples DD and EE. Carry out the following experiments by following the given procedures.

Experiment I:

(i) Place 3 g of sample DD (finely ground rice flour) in a beaker and add 10 ml of distilled water. Stir well.

(ii) Leave the suspension to settle for 5 minutes. Decant the supernatant and retain the sediment.

(iii) Place a drop of the sediment on a glass slide, stain with iodine solution and observe under a microscope.

Experiment II:

(iv) Put 2 g of sample EE (corn starch) into a clean porcelain dish. Heat it gently until the colour changes.

(v) Allow it to cool and add a few drops of iodine solution. Record observations.

Questions

(a) Draw and describe the microscopic structures observed in Experiment I.

(b) Explain the significance of the colour changes in step (iii).

(c) Identify the reaction that took place in Experiment II, step (iv).

(d) Why does the iodine test give a different result before and after heating in Experiment II?

(e) State two uses of starch modification in food industries.

2. You are provided with a fresh egg labelled sample FF. Separate the egg white from the yolk and perform the following procedures:

Experiment I:

(i) Place 2 ml of egg white in a test tube. Add 1 ml of 10% sodium hydroxide solution and then add 3

drops of 1% copper sulphate solution. Record your observations.

(ii) Heat another 2 ml of egg white in boiling water for 5 minutes. Record observations.

Experiment II:

(iii) Place a small portion of egg yolk in a porcelain dish. Heat gently until brown fumes appear. Record the colour and smell.

Questions

(a) State the food nutrient tested in step (i) and explain the principle of the test.

(b) What property of proteins is demonstrated in step (ii)?

(c) What does step (iii) demonstrate about egg yolk composition?

(d) Justify the use of eggs as functional ingredients in baking and food preparation.

3. You are provided with samples GG (baker's yeast), HH (glucose solution) and lime water. Perform the following:

Experiment I:

(i) Place 50 ml of sample HH into a conical flask. Add 3 g of sample GG and shake well.

(ii) Fit the flask with a cork and connect it to a delivery tube dipped into lime water.

(iii) Leave for 15 minutes and record the changes in lime water.

(iv) Smell the contents of the flask before and after 15 minutes.

Experiment II:

(v) Repeat steps (i)–(iii) but place the flask in hot water at 70 °C.

Questions

(a) Identify the gas evolved in Experiment I, step (iii).

(b) Write a balanced equation for the reaction taking place in Experiment I.

(c) Explain the effect of temperature observed in Experiment II.

(d) State two industrial applications of the process demonstrated in Experiment I.

(e) Briefly explain the importance of yeast in bread making.