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: 2013**

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 sweet potato tuber (sample U). Carry out the following procedures:

   (i) Peel and cut thin slices of sample U. Place one slice on a glass slide, stain with iodine, and observe under a microscope.

   (ii) Boil another slice in water for 5 minutes, cool, and add iodine solution. Record colour changes.

   (iii) Roast a third slice over a flame until brown, then crush and test with Benedict's solution after boiling.

   Questions

   (a) Draw the microscopic structures seen in step (i) and describe their properties.

   (b) Explain the colour changes in step (ii).

   (c) Identify the nutrient tested in step (iii).

   (d) State the nutritional importance of sample U.

2. You are provided with two food samples V and W. Perform the following experiment:

   (i) Place 3 ml of sample V (egg white solution) in a test tube and add 2 ml of 10% sodium hydroxide, then add 1% copper sulphate drop by drop. Record your observation.

   (ii) Place 3 ml of sample W (gelatin solution) in a test tube, heat gently in boiling water for 5 minutes and cool. Add a few drops of trichloroacetic acid. Record observations.

   Questions

   (a) Identify the nutrients present in samples V and W.

   (b) Explain the scientific principle behind the colour change in step (i).

   (c) Outline the functional property of the nutrient in step (ii).

   (d) Give two food uses of the nutrient in samples V and W.

3. You are provided with ripe banana slices (sample X) and lemon juice. Perform the following experiment:

   (i) Place a slice of sample X on plain paper and leave for 10 minutes.

(ii) Place another slice in lemon juice for 10 minutes.

(iii) Place a third slice in boiling water for 3 minutes, then leave for 10 minutes.

Questions

(a) State the observations in steps (i), (ii), and (iii).

(b) Explain the enzymatic reaction responsible for the changes in step (i).

(c) Why did colour change not occur in steps (ii) and (iii)?

(d) State two benefits of browning in food processing.