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: 2015**

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 sample P and solutions Q, R and S. Carry out the following procedures:

   (i) Place 10 ml of sample P in a test tube and add 3 drops of solution Q. Warm gently in a water bath. Record your observations.

   (ii) In another test tube, add 5 ml of sample P and introduce 3 drops of solution R. Heat to boiling. Record your observations.

   (iii) To a fresh 5 ml portion of sample P, add 1 ml of solution S. Stir and observe the changes.

   Questions

   (a) Identify sample P.

   (b) What property of the main nutrient is demonstrated in procedure (i)?

   (c) Name the nutrient demonstrated in procedure (ii).

   (d) What chemical reaction is shown in procedure (iii)?

   (e) Give two functions of the nutrient in human nutrition.

2. You are provided with fruit sample T. Slice it into four equal portions and immediately perform the following treatments:

   (i) Leave the first portion on a clean plate.

   (ii) Dip the second portion into cold distilled water.

   (iii) Rub the third portion with common salt.

   (iv) Place the fourth portion in boiling water for 2 minutes. Leave all the portions exposed for 15 minutes and record your observations.

Questions

(a) What reaction occurred in the untreated slice?

(b) How did treatments (ii), (iii), and (iv) influence the reaction? Explain.

(c) Explain two ways this reaction can be prevented in food industries.

3. You are provided with samples U, V, W, X and Y. Perform the following procedures:

(i) Accurately weigh 5 g of sample U into a conical flask.

(ii) Add 50 ml of solution V into the flask.

(iii) Introduce 1 ml of solution W and swirl thoroughly.

(iv) Heat the mixture in a water bath at 70–75 °C for 10 minutes.

(v) Titrate the hot mixture against solution X until the colour changes permanently.

(vi) Repeat step (v) to obtain concordant titres.

Questions

(a) Identify solution V and its role in this experiment.

(b) What was the purpose of adding solution W?

(c) Calculate the saponification value of sample U.

(d) From literature, normal cooking oils have saponification values between 190–200. Compare your result with the literature value and state its significance.

(e) Suggest two reasons why the heating in step (iv) is necessary.