THE UNITED REPUBLIC OF TANZANIA
NATIONAL EXAMINATIONS COUNCIL OF TANZANIA
CERTIFICATE OF SECONDARY EDUCATION EXAMINATION

032/2B

CHEMISTRY 2B
ACTUAL PRACTICAL B
(For Both School and Private Candidates)

Duration: 2:30 Hours **Year: 2025**

Instructions

1. This paper consists of **two (2)** questions. Answer **all** the questions.
2. Each question carries **twenty five (25)** marks.
3. All writings must be in **blue** or **black** ink, **except** drawings which must be in pencil.
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).
6. You may use the following atomic masses:
   H = 1, C = 12, O = 16, Na = 23.

2 501032 222012

Scanned with CamScanner

1. A household sewage discharges 1000 litres of waste water in a day. The waste water also contains an acidic contaminant which releases one hydrogen ion in aqueous solution, hence it requires pretreatments before being released to the environment. The process is done by adding calcium carbonate in the sewage tank. A bottle of filtered waste water labeled **AA** is brought into your school laboratory for analysis. Other substances present in the laboratory include the following solutions:

BB: 0.1 M sodium hydroxide.

CC: Methyl orange.

Procedure

(i) Put **AA** into a clean burette.

(ii) Pipette 25 cm^3 or 20 cm^3 portion of **BB** into a conical flask.

(iii) Titrate the flask content with **AA**, by using **CC** indicator.

(iv) Perform three more titrations and record the results in tabular form.

Questions

(a) Calculate the volume of waste water that requires 25 cm^3 or 20 cm^3 of **BB** for complete neutralization.

(b) What was the colour of the conical flask content at the end point of the reaction?

(c) Why the first titration is ignored in the calculations?

(d) Calculate:

(i) the concentration of the contaminant in moles/dm^3.

(ii) the number of moles of hydrogen ions (H^+) present in a single day waste water discharge.

(iii) the mass of calcium carbonate needed to neutralize the whole acid in a single day discharge.

Scanned with CamScanner

2. A pharmaceutical company investigates the composition of a cough medicine which has lost its identity. A pharmacist gives a temporary identity **M**, and brings to your school laboratory for analysis. Follow the procedure given in the table and identify the composition of the medicine and answer the questions that follow:

S/N	Experiments	Observations	Inferences
(a)	Observe the appearance of sample **M**.		
(b)	Heat a little amount of sample **M** in a dry test tube.		
(c)	Transfer a little amount of sample **M** into a dry test tube and add dilute hydrochloric acid.		
(d)	Transfer a little amount of sample **M** into a dry test tube and add distilled water. Stir the contents.		
(e)	Transfer a little amount of sample **M** into a dry test tube and add NaOH solution then warm.		
(f)	Transfer a little amount of a mixture prepared in experiment (d) into a dry test tube and add $MgSO_4$ solution.		

Questions

(i) Identify the ions present in sample **M**.

(ii) Write the molecular formula of the component in the medicine.

(iii) Write the IUPAC name of the component in the medicine.

(iv) Write the balanced chemical equation on what happened in experiment (b).

Scanned with CamScanner