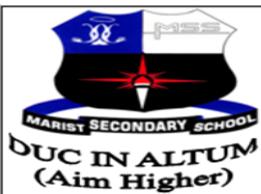EXAMINATION NUMBER _____

MARIST SECONDARY SCHOOL

P.O. Box 46
Malirana

Dedza, MALAWI.

Tel: (+265) 0111 900 130/0993 242 500

E-mail: maristhead@gmail.com

2021 FORM FOUR MOCK EXAMINATIONS

CHEMISTRY

PAPER II

Practicals

40 marks

Time allowed: 2 hours

1. This paper has **6** pages. Please check.

2. Write your examination number on each top of each page.

3. This paper consists of two sections **A** and **B**. **Section A** carries **20 marks** and has descriptive questions and **Section B** carries **20 marks** with practical questions.

4. The maximum number of marks for each answer is indicated against each question.

5. Write your answers in the spaces provided on the question paper.

SECTION A
(20 marks)

1. a.   Describe an experiment that can be used to prepare zinc sulphate crystals by a reaction between an acid and a metal

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(4 marks)

b. Given the following compounds in unlabeled beakers CH_3CH_2OH, CH3CH2COOH, CH_3CHO, describe an experiment you can do to identify them.

_____

_____

_____

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4 marks

2. a. With an aid of a diagram, explain how ion-exchange method is used to remove permanent water hardness?

_____

_____

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(4 marks)

b. In an experiment to investigate changing mass of the reactants with time, a student mixed 2g of small marble chips and 40cm^3 of 2.0M hydrochloric acid

$$HCl(aq) + CaCO_3 (aq) \longrightarrow CaCl(aq) + H_2O(l) + CO_2(g)$$
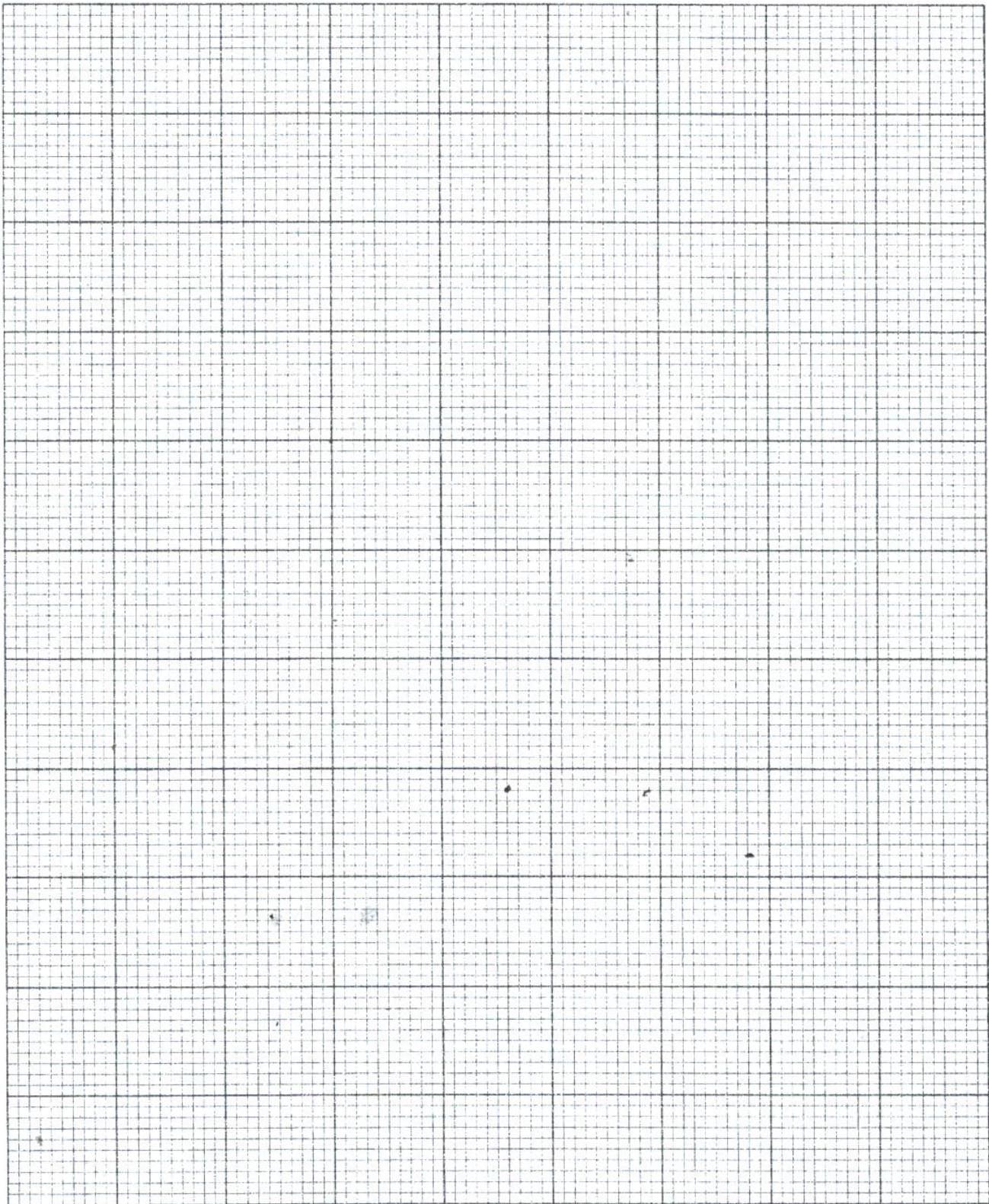
The following results were obtained

Loss in mass (g)	0.10	0.15	0.18	0.2	0.2
Time (s)	20	40	60	80	100

a. Use data in table above, to plot a graph of loss of mass against time.   (**5 marks**)

b. On your graph sketch the time you would expect if the experiment were repeated with 40cm^3 of 0.5 M hydrochloric acid   1 mark
c. Explain your answer in 10b.

_____

_____

                                                                                                    2 marks

SECTION B
20 marks

3. You are provided with three beakers labeled A, B and C containing cations. You are also provided with sodium hydroxide solution in a dropper bottle and three test tubes in a rack.
   a. Pour about 2cm^3 of the solutions A, B and C in different test tubes.
   b. Add 5 drops of sodium hydroxide solution in each test tube.
   c. Record your observations in the table of results.
   d. Add 15 more drops of sodium hydroxide solution in the test tubes.
   e. Record your observations in the table of results.

TABLE OF RESULTS

	Observations	
	After adding 5 drops	**After adding 15 more drops**
A		
B		
C		

                                                                                                    (6 marks)

   f. Use the results to which beaker contains
      i.   Cu^{2+} ions   : _____
      ii.   Fe^{3+} ions   : _____
      iii. Al^{3+} ions   : _____

                                                                                                    3   marks

g. Which other reagent apart from sodium hydroxide can be used to identify the cations?

_____

1 mark

4. You are provided with a measuring cylinder, four test tubes, a dropper 1.5M hydrochloric acid (HCl(aq) solution, four samples of sodium hydroxide (NaOH) of unknown concentrations in beakers labeled X, W, Z and Y and phenolphthalein indicator.

   a. Put $2cm^3$ of sample X into a test tube.
   b. Add one drop of phenolphthalein indicator into the test tube.
   c. Add hydrochloric acid solution drop by drop while counting the drops until the solution becomes colourless.
   d. Record the number of drops added in the table of results.
   e. Repeat steps a to d using sample W, Z and Y

TABLE OF RESULTS

Sample	Number of drops of Hydrochloric acid
X	
W	
Z	
Y	

(4 marks)

   f. Arrange samples X, W, Z and Y in order of increasing concentration.

_____

2 marks

   g. Write a balanced chemical equation for the reaction in the experiment.

_____

2 marks

   h. Mention any two ways of increasing the rate of the reaction between hydrochloric acid and sample X.

_____

_____

END OF QUESTION PAPER