FIRSTNAME _____ **SURNAME** _____ **CLASS**_____

2020 CHINSAPO CLUSTER MOCK

MALAWI SCHOOL CERTIFICATE OF EXAMINATIONS

CHEMISTRY

Subject Number:M036/I

Time allowed: 2hours

8:00a.m-10:00a.m

PAPER I

(100 marks)

Instructions

1.This paper contains **11** printed pages. Please check

2.Fill in your name at the top of each page

3.This paper contains two sections,**A** and **B**.In section **A** there are **seven** short answer questions while section **B** there are **three** restricted essay questions

4.Answer all the **10** questions in the spaces provided

5.Use of electronic calculator is allowed

6.The maximum of marks for each question is indicated against each question

7.In the table provided on this page, tick against the number of question you have answered

Question Number	Tick if answered	Do not write in this column	
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

 Turn over

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SECTION A (70 marks)

1a. Define electronic configuration

_____

(1mark)

b. The table below gives elements represented by letters **T, U, V, W, X, Y** and their atomic numbers.

Element	**T**	**U**	**V**	**W**	**X**	**Y**
Atomic number	12	13	14	15	16	17

(i) Write electronic configuration of element V

_____

(1mark)

(ii) How does atomic radius of V compare with that of X? Explain.

_____

_____

(2marks)

(iii) Give the formula of the compound that could be formed between T and Y.

_____

(1mark)

(iv) What type of bonding will be present in compound formed T and Y? Explain.

_____

_____

(2marks)

(v) Draw a dot and cross diagram to show the structure of the compound formed in 1b (iv) above?

(3marks)

2a. Define an acid according to Bronsted-Lowry Theory

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_____

(1mark)

b. Water reacts with the carbonate ion in reversible reaction according to the following chemical equation

$H_2O\ (l) + CO_3^{2--}\ (aq) \rightleftharpoons OH^{--}(aq) + HCO_3^{--}\ (aq)$

(i) What is a reversible reaction

_____

_____

(1mark)

(ii). Write the conjugate acid-base pairs in the equation **2b** above

_____

(2marks)

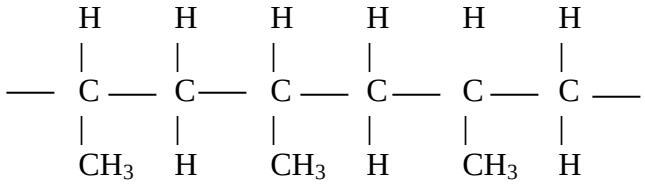
3a. What is a polymer?

_____

_____

(1mark)

b. Below is a section of the polymer polypropene.



(i) Draw and name the structure of its monomer

(3marks)

(ii). State any two uses of polypropene.

_____

_____

(1mark)

c. The diagrams below show the arrangement of polymer chains in plastics after heating.

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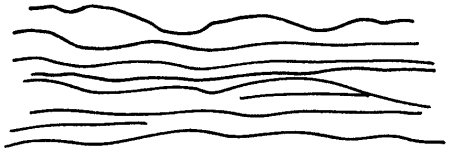
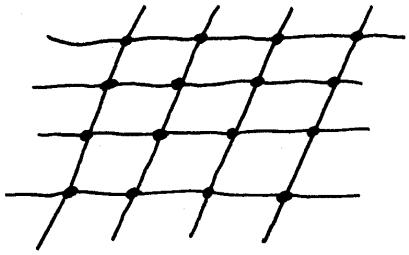


E



F

(i). State the type of plastics of plastics represented by **E** and **F**

E _____ **F** _____

(2marks)

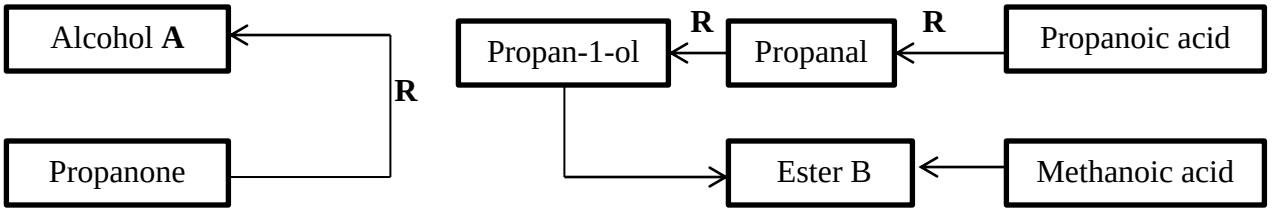
(ii). Give a reason for your answer to c (i) above

_____

_____

(2marks)

4 Study the reaction scheme and answer the questions that follow.



a. Give the systematic (IUPAC) name for (i) the alcohol A, (ii) the ester B.

Alcohol A _____ Ester B_____

(2marks)

Alcohol A and propan-1-ol are structural isomers.

b. What are isomers?

_____

_____

(1mark)

c. What is the structural difference between a primary alcohol and a secondary alcohol?

_____

_____

(2marks)

d. Identify another pair of structural isomers from the reaction scheme and draw them

Isomers _____

(1mark)

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Structures

(2marks)

e. Propanal is oxidised by Fehling's reagent. Describe how this reaction is carried out.

_____

_____

_____

_____

(3marks)

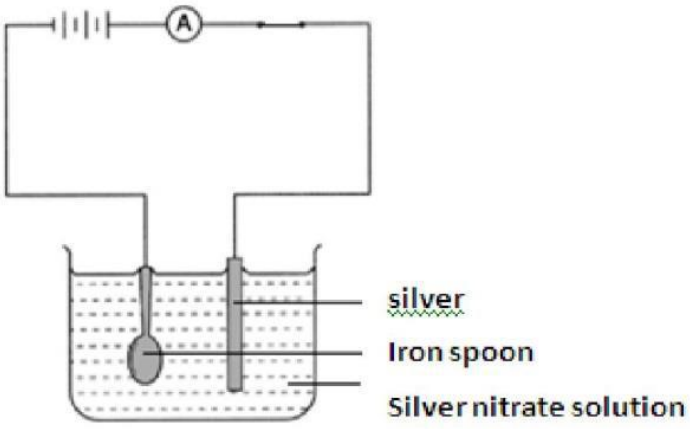
f. Why does propanone not react with Fehling's reagent?

_____

_____

(2marks)

4 Figure 1 below is a set-up of an apparatus shown on in order to cover an iron spoon with silver.



a. What is this process called?

_____

(1mark)

b. Explain why the spoon must be connected as the cathode

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_____

_____

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(3marks)

c. Use half equations to explain what is happening

(i) At the anode

_____

_____

(2marks)

(ii) At the cathode

_____

_____

(2marks)

d. State the difference between galvanizing and tin-plating

_____

_____

(2marks)

5a. What is hard water

_____

(1mark)

b. State the chemical name of a compound which causes **temporary** hardness in water.

_____

(1mark)

c. Explain how boiling removes temporary water hardness

_____

_____

_____

(2marks)

d. State two **disadvantages** associated with hard water.

_____

_____

_____

(2marks)

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6a. State the difference between limiting reagent and excess reagent

_____

_____

_____

(2marks)

b. When 1.92g of magnesium (Mg) is heated in excess oxygen (O), 3.0g of magnesium oxide (MgO) is obtained (Mg = 24 O = 16)

(i). Calculate the theoretical yield of magnesium oxide (MgO)

(4marks)

c. Calculate the percentage yield of magnesium oxide

(2marks)

7a. Define a precipitate

_____

_____

(1mark)

b. Barium sulphate is a precipitate.

(i) Name two solutions which you could mix to give a precipitate of barium sulphate from the mixture.

_____ and _____

(2marks)

(ii) Describe what you would do to obtain barium sulphate from the mixture?

_____

_____

_____

_____

(2marks)

(iii) Write a chemical equation for the reaction.

_____

(2marks)

b. Name two allotropes of Sulphur

_____

_____

(2marks)

c. Which allotropes of Sulphur is more stable at room temperature

_____

(1mark)

Section B (30 marks)

Answer **all** the questions in this section

8. With the aid of a well labelled diagram, describe how the concentration of sodium hydroxide can be found using a known concentration of sulphuric acid

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(10marks)

9. With the aid of a well labelled diagrams, describe an experiment that could be done to show that both air and water are necessary conditions for rusting to take place. Give expected results

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(10marks)

10.With a well labelled diagram, describe an experiment that could be done to distinguish a strong acid from a weak acid using the conductivity apparatus

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(10marks)

END OF QUESTION PAPER