NAME: _____ SCHOOL_____

MATAPWATA CLUSTER MOCK EXAMINATIONS

2022 MALAWI SCHOOL CERTIFICATE OF EDUCATION MOCK EXAMINATION

CHEMISTRY

PAPER I
(100 Marks)

Subject Number: M012/I Time Allowed: 2 hours

TUESDAY, 31 May, 2022

Instructions:

1. This paper contains **10 pages**. Please check.
2. This paper contains **two** sections **A** and **B**. Answer **all** question in **both** sections in the spaces provided on.
3. Write your **Name** on top of each page.
4. In the table provided tick against a number of question you have answered.
5. Hand in your answer sheet to the invigilator when time is called to stop to stop writing.

Question Number	Tick if Answered	Do not write in these columns	
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
	Total		

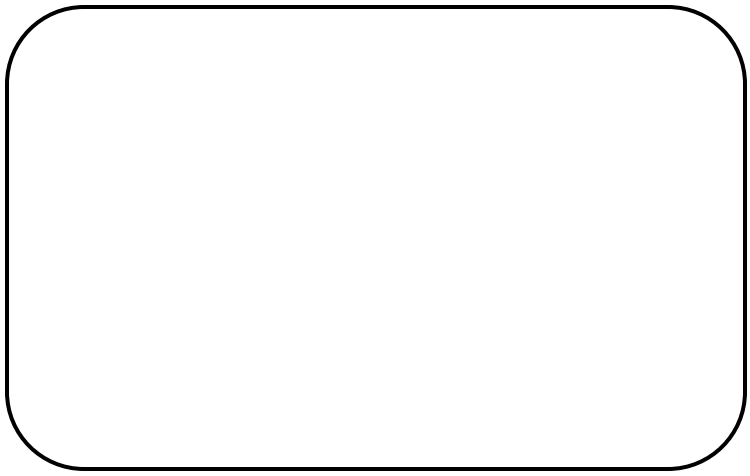
NAME:_____ **SCHOOL**_____

SECTION A (70 MARKS)

1. (a) State any one branch of chemistry.

_____ (1 mark)

(b) Draw a safety symbol which can show that the substance is harmful.



(1 mark)

(c) How could you know whether water from the water board is pure water or not.

_____

_____

_____ (3 marks)

(d) Explain the test for the presence of Oxygen gas.

_____

_____

_____ (3 marks)

2. (a) Explain the trend in reactivity of halogens down the group in a periodic table.

_____

_____

_____

_____ (3 marks)

(b) An element X has atomic number 17 and 18 neutrons.

i. Write down the electron configuration of element X.

_____ (1 mark)

ii. To which group of periodic table does element X belong?

_____ (1 mark)

iii. Write down the molecular formular of a compound formed when element X reacts with magnesium (Mg) a group II element.

_____ (2 marks)

3. (a) State any two uses of phosphorus.

_____

_____ (2 marks)

(b) Explain the economic importance of Sulphuric acid to the nation.

_____

_____ (2 marks)

4. (a) Briefly explain how you can separate salt from the mixture of salt and sand.

_____

_____

_____

_____

_____

_____

_____ (6 marks)

(b) Calcium (Ca) reacts with Chlorine (C*l*) to form calcium chloride.

(i) Draw a dot and cross diagram for calcium chloride.

(3 marks)

(ii) State one physical property of calcium chloride.

_____ (1 mark)

(c) Mention one difference between Polar and non-Polar molecules.

_____

_____

_____ (1 mark)

(d) Explain one importance of alloys.

_____

_____ (1 mark)

5. (a) Define an acid according to Bronsted-Lowry Theory.

_____

_____

_____ (1 mark)

(b) Identify one conjugate acid-base pairs in the equation:

H_2SO_4 (e) + H_2O (e) $\rightleftharpoons$ H_3O^+ (aq) + HSO_4^- (aq)

_____ (1 mark)

6. Letters A, B C and D represent elements. Use E^0 values given to answer the questions that follow.

Electrode reaction	E^0 (V)
A^{2+} (aq) + Ze^- ⟶ A(s)	- 2.90
B^{2+} (aq) + Ze^- ⟶ B (s)	- 2.38
C^+ (aq) + e^- ⟶ ½ Cz (s)	0.00
D^{2+} (aq) + $2e^-$ ⟶ D (s)	+ 0.34

(a) Write the line notation of the cell formed when A and D are used.

_____ (2 marks)

(b) Calculate the electromotive force (emf) for the cell in (a).

(2 marks)

7. The table below shows some bond energies. Use it to answer questions that follow.

Bond type	Bond dissociation energy (KJ/Mol)
C – H	414
C – C	346
O = O	497
C = O	749
O - H	461

(a) Calculate the enthalpy change for the following reaction.

$C_3H_8\,(g) + 5O_2\,(g) \longrightarrow 3CO_2(g) + 4H_2O\,(e)$

(5 marks)

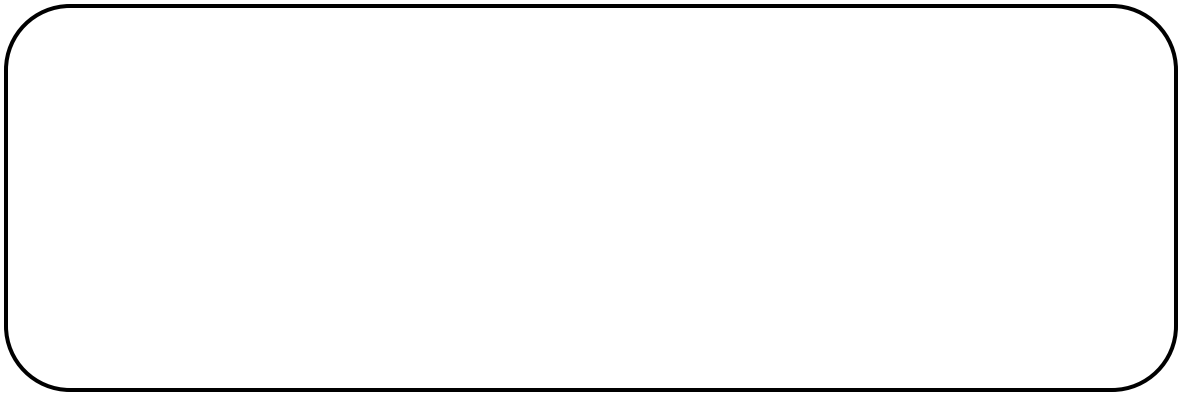
(b) i. Is the reaction exothermic or endothermic?

_____ (1 mark)

ii. Explain your answer to b(i)

_____ (1 mark)

(c) Draw an energy level diagram for the reaction.



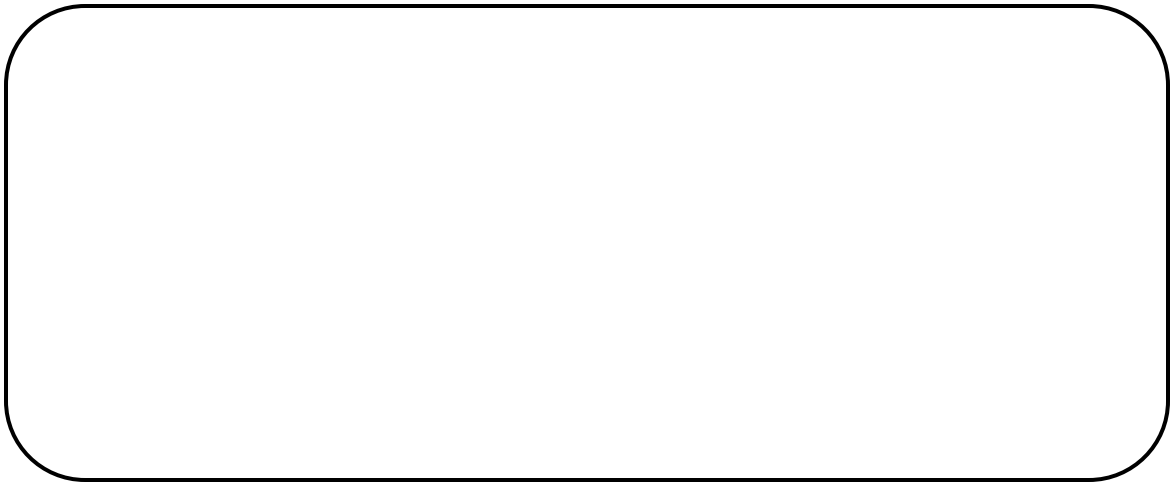
(2 marks)

8. (a) Define the term isomers.

_____

_____ (1 mark)

(b) Draw any two isomers of Butanoic acid.



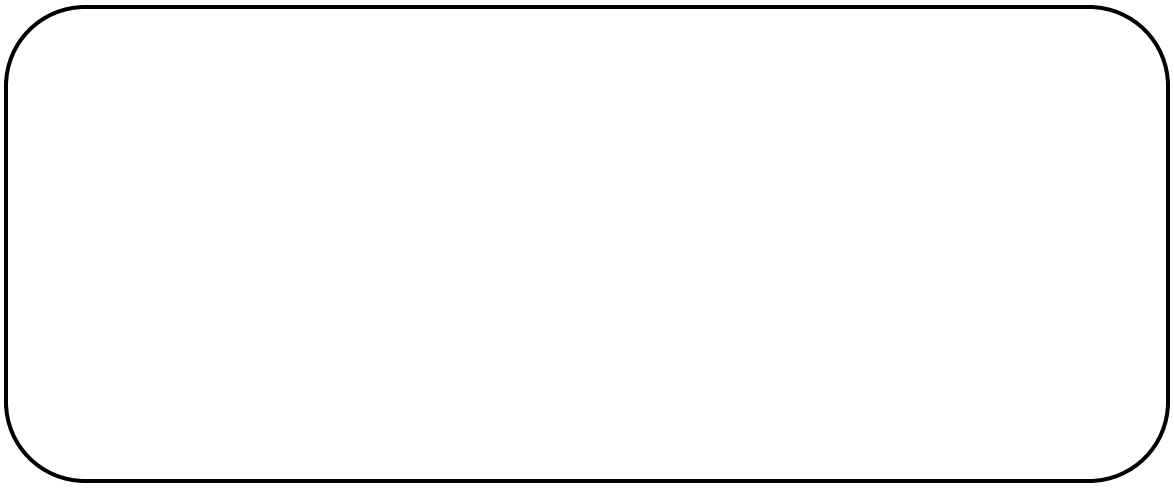
(2 marks)

(c) State the two types of polymerization.

_____

_____ (2 marks)

(d) Draw the structural formular of 3-methylbutan -2- one.



(2 marks)

9. (a) Give any two differences between thermosoftening plastics and thermosetting plastics.

i. _____

ii. _____ (2 marks)

(b)Explain the effect of branching on boiling point of hydrocarbons.

_____

_____

_____

_____ (3 marks)

(c)What is the difference between esterification and saponification.

_____

_____

_____

_____ (2 marks)

(d)State any one physical property of esters.

_____

_____

_____ (1 mark)

NAME: _____ **SCHOOL**_____

10. (a) Explain one way in which hard water is a nuisance in industries.

_____

_____ (1 mark)

(b) Give any one way of mitigating global warming.

_____

_____ (1 mark)

(c)Describe any one economical benefit of recycling wastes.

_____

_____

_____ (2 mark)

SECTION B (30 Marks)

11. (a) 12.35g of Copper (II) carbonate was heated in a crucible, 7.Og of Copper (II) oxide was produced according to the equation: $CuCO_3$ (s) $\xrightarrow{heat}$ CuO (s) + CO_2 (g). Calculate the percentage yield of Copper (II) oxide. (Ar: C = 12, O = 16, Cu = 64)

(5 marks)

(b)Describe how corrosion occurs in iron. Include equations in your description.

_____

_____

_____

_____

_____ (5 marks)

12. With the aid of a diagram describe the indigenous way of preparing ethanol.

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____ (10 marks)

NAME: _____ **SCHOOL**_____

13. With the aid of a diagram explain the water cycle.

_____ (10 marks)

END OF QUESTION PAPER