**NAME...................................................................................... ADM NO...................CLASS……..............**

**DATE.......................**

**GATITU MIXED SECONDARY SCHOOL**

**CHEMISTRY**

**FORM THREE**

**FOR EXAMINER’S USE ONLY**

**Question (50 MARKS) TOTAL SCORED**

**1 - 16**

**(Theory)**

**MIDTERM 1 EXAM 2015**

**TIME: 1⅟2 Hours**

**INSTRUCTIONS TO CANDIDATES**

* ***Write your name and admission number in the spaces provided.***
* ***Answer all the questions in the spaces provided.***
* ***Mathematical tables and electronic calculators may be used.***
* ***All working MUST be clearly shown where necessary.***

1. 20cm3 of 2M concentrated sulphuric acid were reacted with 18cm3 of hydrous sodium hydroxide. Calculate the molarity of sodium hydroxide solution. (3 marks)

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1. When 50 cm3 of 2MHCl was reacted with an alkaline solution of sodium hydroxide, a salt was formed.
2. Name the salt formed. (1 mark)

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1. Give two uses of the salt named above. (1 mark)

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1. Name the reaction above. (1 mark)

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1. Calculate the number of moles of sodium hydroxide that reacted with the acid. (2 marks)

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1. Explain what happens to litmus paper in chlorine water. Give a reason. (2 marks)

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1. Explain two ways in which carbon (II) oxide can be prepared in the laboratory. (2 marks)

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1. In a reaction 20cm3 of 0.1M Sodium Carbonate completely reacted with 13cm3 of dilute sulphuric acid. Find the molarity of the sulphuric acid used. (3 marks)

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1. An organic compound P contains 68.9% carbon, 13.5% hydrogen and 21.6% oxygen.

The relative formula mass of **p** is 74. Determine its molecular formula. [C=12, H=1, 0=16] (3 marks)

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1. 1.6g of magnesium metal is reacted with excess hydrochloric acid. Calculate the volume of hydrogen gas produced (2 marks)

(Molar gas volume at s.t.p = 22.4dm3 Mg=24)

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1. 20cm3 of 0.50M hydrochloric acid was used to neutralize 0.50g of a divalent metal carbonate, MCO3.
2. Calculate the number of moles of the acid used (2 marks)

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1. Write a balanced chemical equation of the reaction occurred (1 mark)

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1. Calculate the number of moles of the base used. (2 marks)

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1. Determine the relative formula mass of the metal carbonate. (2 marks)

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1. What is the relative atomic mass of metal M? (2 marks)

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1. Identify metal M (1 mark)

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1. a) State the Boyle’s law (1 mark)

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b) A certain mass of a gas occupies 250cm3 at 250C and 750mmHg. Calculate its volume at 250C if pressure changes to 760mmHg in SI units. (3 marks)

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1. Study the scheme below and answer the questions that follow.

Chamber A

NaHCO3

Brine

Na2CO3

NH4CI

Carbon Process I

(IV) Oxide

Chamber B

Gas P Ca (OH) 2

1. (i) Write the equations of reaction that occur in
   1. Chamber A (1 mark)

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* 1. Chamber B (1 mark)

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1. Explain why process I is possible yet NaHCO3 and NH4Cl are both soluble in water. (1 mark)

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1. It takes 20 seconds for 200cm3 of oxygen gas to diffuse through a porous plug. How long will it take 100cm3 of sulphur (IV) oxide to diffuse through the same porous plug? (S=32 O=16) (3 marks)

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1. The empirical formula of a hydrocarbon is CH2. The hydrocarbon has a relative molecular mass of 56 (H=1.0, C=12.0)
   1. Calculate the molecular formula of the hydrocarbon. . (2 marks)

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* 1. To which homologous series does the hydrocarbon belong? (1 mark)

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1. Magnesium Chloride is insoluble in Methylbenzene while Aluminium chloride is fairly soluble. Explain. (2 marks)

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1. Name the following compounds. (1⅟2 marks)

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H-C- C- C- C- C- C- C-H

H H H H H H H ……….………………………………………………………

1. CH3CH2CHCH3CH3 ………………………………………………………………..
2. Draw the atomic structure of the following; (2 marks)
3. Neon

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1. Phosphorous

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1. When a solution of lead (II) nitrate was reacted with dilute hydrochloric acid, a white precipitate was formed then turns to colourless solution when warmed.
2. Name the white precipitate formed (1/2 marks)

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1. Explain why the white precipitate turns to colourless solution when warmed (1 mark)

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**“Education is the most powerful weapon you can use to change the world” Nelson Mandela**

**(The 9th President of South Africa)**

**Wishing you success Mr. Chihi**