FORM 2
CHEMISTRY
END TERM EXAM – MARCH 2016
TIME: 2 HOURS

NAME: ……..…….CLASS:……. ADM NO:……

INSTRUCTIONS
1. Write your name and admission number on the spaces provided.
2. Answer your questions in spaces provided.
3. All working must be shown clearly.
4. Silent electronic calculators may be used.

For examiners use only

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1. What is a mixture? (1mk)

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2. Study the information given below and answer the questions that follow.
Red dye is more soluble than green, green is more soluble than yellow. Whereas blue is the least soluble. Represent the four dyes on a round paper chromatogram. (3mks)

b) Name two industrial application of chromatography. (2mks)

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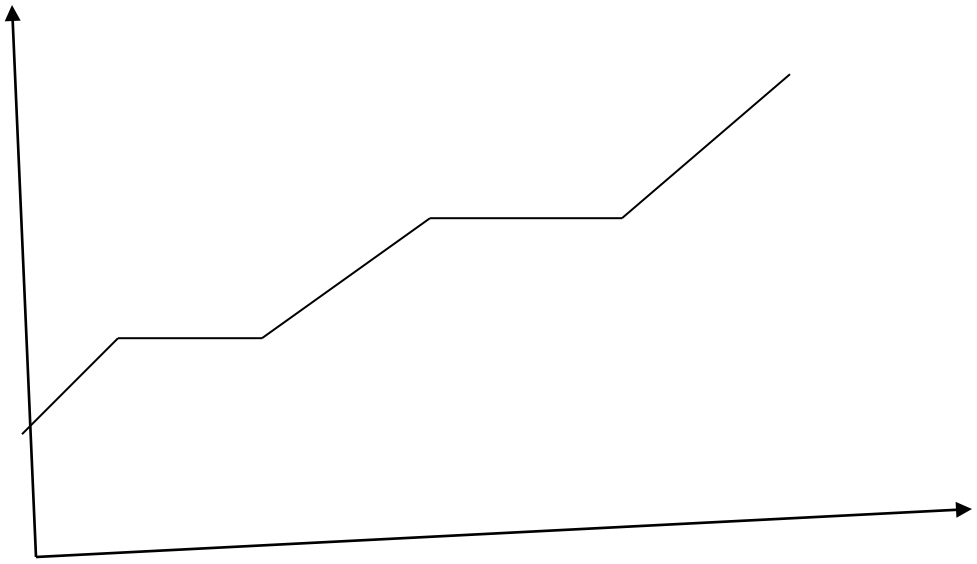
3. The graph below shows the shape of a curve obtained when a solid of pure naphthalene is heated to boiling.



a) From the graph identify: (1.5mks)

i) Melting point –

ii) Condensation point-

b) What are the physical states at (1.5mks)

i) AB-

ii) BC-

c) Explain what is happening at : (2mks)

i) AB

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ii) DE

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4. The diagram below shows the effect of heat on hydrated copper (II) sulphate.

a) What is the coloure of? (1mk)

i) Hydrated copper (II) sulphate -

iii) Anhydrous copper (II) sulphate –

b) Explain how you can confirm that the liquid L is (2mks)

i) Water

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ii) pure water

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5. Use the following table to answer the questions that follow.

Solution	A	B	C	D	E	F	G	H
pH	1.0	4.0	5.0	6.5	7.0	7.5	8.0	11.0

a) Select the most acidic solution (1mk)

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b) Which solution is distilled water? Explain. (2mks)

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c) Which solution is likely to be: (3mks)

i) Lemon juice -

ii) Common salt -

iii) Rain water in areas which experience high carbon(IV) oxide emissions –

6. Study the set-up below and answer the questions that follow.

a) Why is phosphorous stored in water? (1mk)

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b) Write balanced chemical equation for the reaction of phosphorous with. (2mks)

i) excess oxygen

ii) limited oxygen

c) What would be the effect on blue litmus paper by the resulting solution? Explain (2mks)

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6. The following diagram was used to study a property of hydrogen gas. Study it and answer the questions that follow.

a) Name the missing condition in the above set-up. (1mk)

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b) State and explain two observations made in the combustion tube and explain. (4mks)

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c) Using balanced equations show the equations for the reaction between copper (II) oxide and hydrogen. (1mk)

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d) What would be observed if the experiment was repeated using lead (II) Oxide? (2mks)

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7. Study the table below and answer the questions that follow. (The letters do not represent the actual symbols of the elements.

Atom	Atomic number	Mass number
A	8	16
B	11	23
C	13	26
D	13	27
E	17	35

a) write the electron configuration of ; (2 mks)

Atom of A _____ Ion of A _____

Atom of B_____ Ion of B_____

b) Which of the above elements are non- metallic elements? Give a reason. (2mks)

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c) Which element belongs to a different period from the rest? Explain. (2mks)

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d) In which group of the periodic table does A belong? Give a reason. (2mks)

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e) Write the formulae of the most stable ion of (2mks)

i) B-

ii) E-

f) Write the formula of the compound formed between element B and E. (1mk)

8. An ion of nitrogen can be represented as $^{14}_{7}N^{3-}$

Draw a diagram to show distribution of electrons and the composition in the nucleus of the nitrogen ion. (2mks)

9. Use the grid below to answer the questions that follow. The letters do not represent actual symbols of the elements.

a) Which element forms ions with a charge of -2? Explain. (2mks)

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b) What type of bond is formed when

i) Q and R react- (1mk)

ii) T and R . Give a reason. (2mks)

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10. The diagram below is a set-up for the laboratory preparation of oxygen.

a) Name solid R and its purpose. (2mks)

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b) Write a chemical equation for the reactions that takes place in formation of the oxygen gas. (1mk)

c) State how one can test for oxygen. (1mk)

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d) Identify one mistake in the set-up. (1mk)

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11. Excess iron was made to rust in 2 litres of moist air and the remaining volume of air measured each day. The results were recorded as shown in the table below.

Day	0	1	2	3	4	5	6	7	8
Volume (cm^3)	2000	1900	1800	1720	1660	1620	1600	1600	1600

a) What is the chemical name of rust? (1mk)

b) On which day was the reaction complete? Explain (2mks)

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c) Calculate the percentage by volume of oxygen in air used in the rusting process. (2mks)

d) Name two factors that accelerate rusting. (1mk)

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12. Show the bonding in each of the following. (N=7, Na=11, Cl=17, C= 6, H=1, O=8) (3mks)

a) Ammonium ion (**NH_4^+**)

b) Sodium oxide **(Na_2O)**

c) Carbon tetrachloride (CCl_4)

13. The following diagrams show the structures of two allotropes of carbon. Study them and answer the questions that follow.

a) Name allotrope (1mks)

M-

N-

b) Which of the two allotropes conducts electricity? Explain. (1mks)

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14. Explain how mixture of calcium chloride and iron (III) chloride can be separated. (2mks)

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15. The diagram below illustrates the relationship between oxides. Use it to answer the questions that follow.

a) What name is given to the oxide in region; (1.5mks)

i) B -

ii) C -

iii) D -

b) Give an example of an oxide you would place in region; (2mks)

i) A-

ii) B -

iii) C-

iv) D-

16. Name the elements present in the compound potassium chlorate. $(1\frac{1}{2}mks)$

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c) When potassium chlorate is heated, it forms a potassium chloride and a gas is given off.

i) Suggest the identity of this gas (1mk)

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ii) Give another solid that produces oxygen gas when heated in the lab.(1mk)

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17. Hydrogen is prepared in the laboratory by reacting zinc with dilute sulphuric acid.

i) Write a chemical equation for the reaction. (1mk)

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ii) Sketch the apparatus you would use to dry the hydrogen gas formed and collect it. (2mks)

18. The table below shows physical properties of some substances. Use it to answer the questions that follow.

substance	**melting point (°C)**	**Boiling point(°C)**	**Electrical conductivity**	
			Solid	Liquid
U	1083	2595	Good	Good
V	801	1413	Poor	Good
W	5.5	80.1	Poor	Poor
X	-114.8	-84.9	Poor	Poor
Y	3550	4827	Poor	Poor

a) Which substance is likely to have: (1.5 mks)
   i) Simple molecular structure –
   ii) Giant ionic structure –
   iii) Giant atomic structure –

b) Which particles are responsible for conduction of electricity in; (1mk)
   i) Giant metallic structure.-
   ii) Giant ionic structure –

19. Write balanced equation for the following reactions (4mks)

i) Sodium carbonate solution reacted with hydrochloric acid

ii) Nitric acid reacted with calcium hydroxide solution

iii) Magnesium reacted with dilute sulphuric acid.

iv) Carbon reacted with excess oxygen.