NAME: ……..INDEX NO:…….

SCHOOL: ……..SIGNATURE :……

DATE: ……

233/2

Chemistry

Theory

July/August

Time: 2 Hours

KAKAMEGA SOUTH SUB- COUNTY JOINT EVALUATION TEST – 2016

Kenya Certificate of Secondary Examination (KCSE)

233/2

Chemistry

Theory

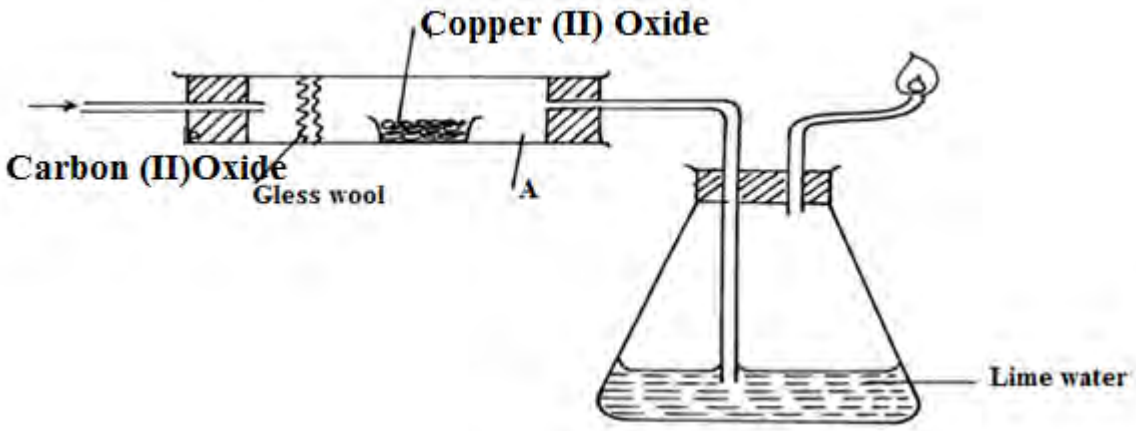
INSTRUCTIONS TO CANDIDATES

1. Write your name and index number in the spaces provided above.
2. Sign and write the date of examination in the spaces provided above.
3. Answer all the questions in the spaces provided in the questions paper.
4. Mathematical tables and silent electronic calculators may be used.
5. All working must be shown where necessary.

QUESTION	MAXIMUM SCORE	CANDIDATE'S SCORE
	80	

This paper consists of 10 printed pages Check the Question paper to ensure that all pages are printed as indicated and no question are missing.

1. The figure below is used to investigate the effect of carbon (II) Oxide on copper (II) Oxide. Study it and answer the questions that follow.



a) Write a chemical equation of the reaction for the preparation of carbon (II) oxide in the laboratory. (1mk)

b) What precaution should be taken when preparing carbon (II) Oxide? (2mks)

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c) State the observations made in apparatus A and B at the end of the experiment? (2mks)

A……..

B……..

d) Write the chemical equation for the reaction in apparatus A. (1mk)

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e) State the reducing agent in (d) above. (1mk)

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f) State two application of carbon (II) Oxide (2mks)

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g) Carbon (IV) oxide in air forming a Gas P.

(i) Name the gas P (1mk)

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ii) State two applications of the gas P (2mks)

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2. The table below shows some information concerning elements S, T,V, U and W,. The letters are not the actual symbols of the elements.

Elements	Formula of Oxide	Period
S	S_20	2
T	T_2O_3	3
U	UO_2 or UO_3	3
V	Does not form oxide	3
W	W_2O	4

a) Write down:

i) The electron arrangement of element W. (1mk)

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ii) The formula of the ion formed by element T. (1mk)

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b) Two of the oxides, S_2O and UO_3 were separately dissolved in distilled water. Compare the PH values of resulting solutions. (2mks)

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c) Compare with explanations, the following.

i) The reactivity of S with that of W. (3mks)

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ii) The electrical conductivity of element T with that of magnesium. (2mks)

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iii) The meeting point of element V with that of element x which is just below U in the group. (2mks)

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d) Identify element V. (1mk)

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3. a) The following table gives the standard electrode potential for a number of half.-reactions

$Zn^{2+}_{aq)} + 2e^- \longrightarrow Zn_{(s)}$	-0.76
$Fe^{2+}_{(aq)} + 2e^- \longrightarrow Fe_{(s)}$	-0.44
$I_{2(s)} + 2e- \longrightarrow 2I^-_{(aq)}$	+ 0.54
$Fe^{3+}_{(aq)} + e \longrightarrow Fe^{2+}_{(aq)}$	+ 0.77
$Ge^{4+}_{(aq)} + e- \longrightarrow Ge^{3+}_{(aq)}$	+ 1.61

i) Write a cell equation for the reaction that would give the highest emf.

(2mks)

ii) The strongest reducing agent. Give reason. (2mk)

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……

iii) Which substances in the table could be used to convert iodide ions to iodine(1mk)

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iv) Write an equation for the reaction you would expect to occur when an iron nail is placed in a solution of iron (II) sulphate. (1mk)

b) In the production of aluminum for aluminum oxide, 100 A was passed for 5 hours. How much aluminum was obtained? (1F = 96500C,Al = 27) (2mks)

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c) With an example ,define

i) Primary cell (2mks)

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ii) Secondary cell (2mks)

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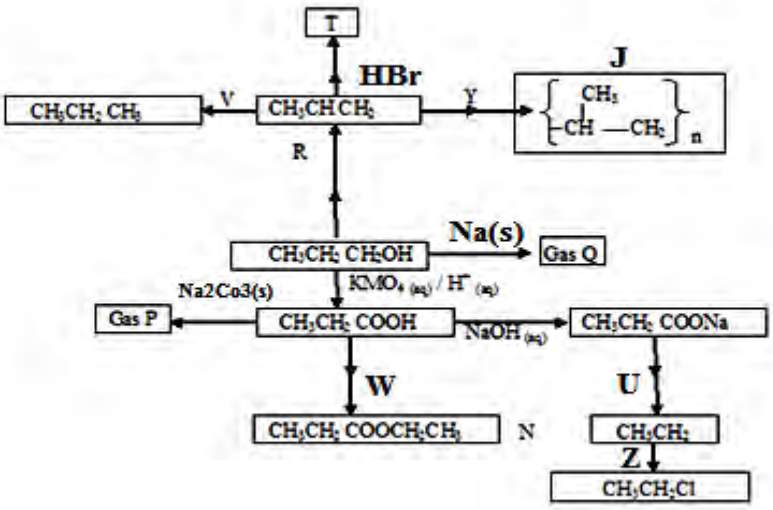
4. Study the reaction scheme below and answer the questions that follow.



a) Name

i) Gas P……

ii) Gas Q……

iii) Substance J……..

b) Write the structural formula of T (1mk)

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……

c) State the characteristics property of substance N (1mk)

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……..

d) Name process Y

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e) Name the type of reaction represented as Z. (1mk)

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f) Name the reagent and condition for reaction

i) V …… (2mks)

……

ii) U…… (2mks)

……..

iii) W…….. (2mks)

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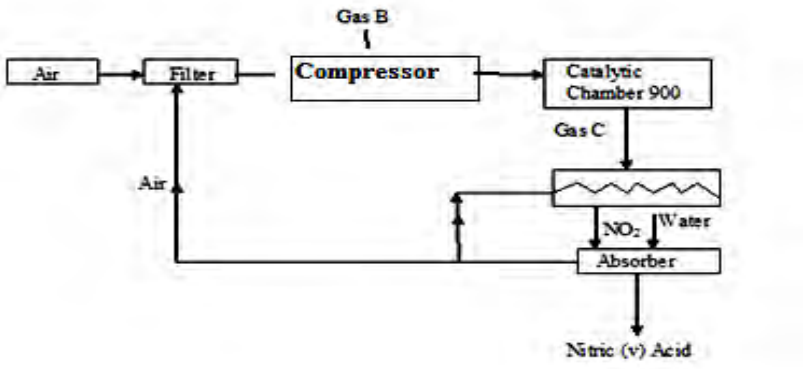
g) Name Process R

…… (1mk)

5. a) The flow chart below shows the industrial manufacture of nitric (v) acid. Study it and answer the questions that follow:



i) Identify substances B and C (2mk)

B……

C…….

ii) Write an equation for the reaction that occurs in the catalytic chamber. (1mk)

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(iii) Using an equation or otherwise. Explain the reaction that takes place in the absorber.(1mk)

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(iv) Explain why nitric (v) acid is stored in brown bottles. (1mk)

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(v) Explain what happens when drops of concentrated nitric (v) acid are put on dry, warm sawdust. (2mks)

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(vi). Give one industrial use of nitric (vi) acid. (1mk)

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b) Chlorine and ammonia gas react producing products depending on the reagent in excess. Write the equations for the reactions when:-

i) Chlorine is in excess (1mk)

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ii) Ammonia is excess. (1mk)

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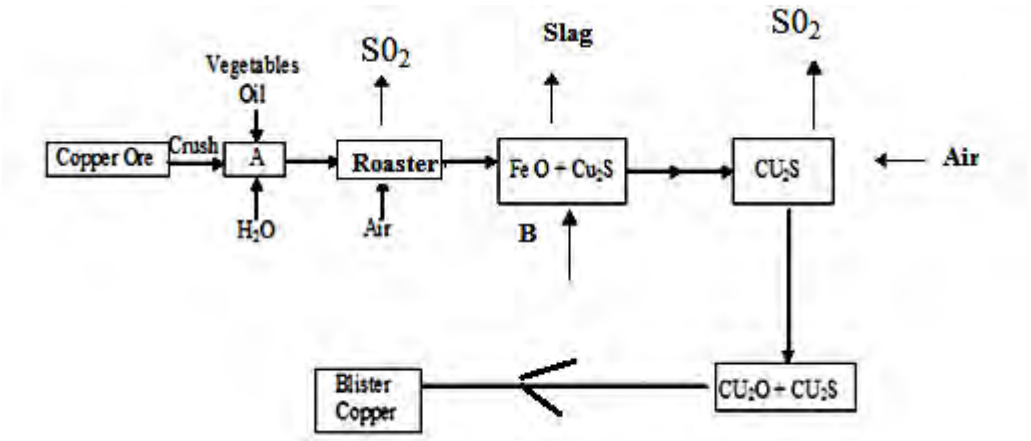
6. Study the flow diagram below on extraction of copper and answer the questions that follow.



a) Name the copper ore used for the extraction of copper. (1mk)

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b) The amount of copper in the copper ore is small state the method used to separate the impurities from the ore in chamber A.

c) i) Which substances is fed into the roaster from chamber A? (1mk)

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ii) Write an equation for the reaction that takes place in the roaster. (1mk)

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d) Name B and state it's function. (2mks)

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e) Why is blister copper not fit for making electrical conductors? (1mk)

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g) When copper is reacted with concentrated nitric (v) acid & blue solution is formed.

i) Name the blue solution. (1mk)

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ii) Name and write the formula of the substance formed when the blue solution reacts with excess aqueous ammonia. (2mks)

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7. The solubility in grammes of sodium nitrate in 100g of water are given for various temperatures in ^{0}c.

Temp (^{0}C)	10	20	30	40	50	60	70	80	90	100
Solubility in g/100g of H_2O	73	80	88	96	104	114	124	148	162	180

a) i) Plot the solubility curve for sodium Nitrate.(Temperature on x-axis) (3mks)

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ii) Determine the temperature at which the solubility of the salt is 150g/100g of water.(1mk)

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b) Given 100g of a saturated solution of sodium Nitrate at 10^0C, Determine the mass of .

i) Solute in the solution

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ii) Solvent in the solution. (1mk)

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iii) Salt that will be dissolved by the amount of solvent in (b) above at 12^0 C. (1mk)

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iv) Salt which must be added to the solution to form a saturated solution at 80^0 C? (1mk)

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c) If a solution containing 140g of salt in 100g of solvent initially at 95^0 is cooled to 45^0C.

(i) At what temperature will crystals start forming? (1mk)

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(ii) How much salt will crystallize out? (1mk)

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