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**KENYA NATIONAL EXAMINATION COUNCIL**  
**REVISION MOCK EXAMS 2016**  
**TOP NATIONAL SCHOOLS**

**SACHO HIGH SCHOOL**  
**CHEMISTRY**  
**PAPER 1**  
**TIME: 2 HOURS**

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CHEMISTRY  
PAPER 1  
TIME: 2 HOURS

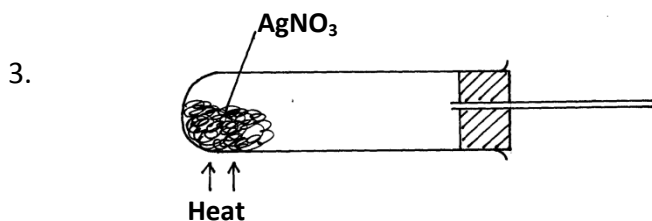
**SACHO HIGH SCHOOL KCSE TRIAL AND  
AND PRACTICE EXAM 2016**

**INSTRUCTIONS TO CANDIDATES:**

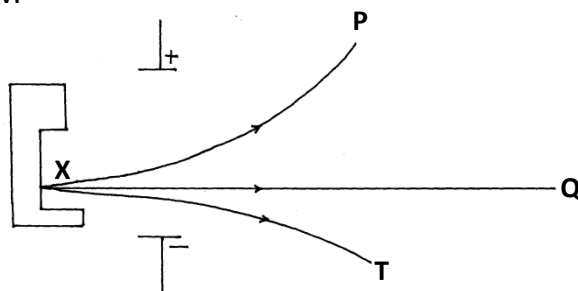
- Write your name and Index number in the space provided above.
- Answer *all* the questions in the spaces provided.
- All working **must** be clearly shown where necessary.
- Mathematical tables and electronic calculators can be used.

Question	Maximum score	Candidate's score
Score 1 - 29	80	

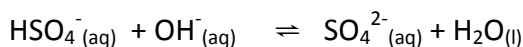
1. (a) Define isotope? (1mk)  
 (b) Silver exists naturally as  $^{107}\text{Ag}$  and  $^{109}\text{Ag}$  only. Determine the relative atomic mass of silver if they have same abundance (2mks)
2. An organic compound is believed to have the structure  $\text{CH}_3\text{CH}_2\text{CH}=\text{CHCOOH}$ . Give two reactions which can be used to characterize the compound. (3mks)



- (a) Give **one** observation made when  $\text{AgNO}_3$  solid is heated. (1mk)  
 (b) Complete the diagram above to show how the products is/are collected. (2mks)
4. The figure below shows the behaviour of emissions by a radioactive isotope x. Use it to answer the question follow.



- (a) Explain why isotope X emits radiations. (1mk)  
 (b) Name the radiation labeled T (1mk)  
 (c) Arrange the radiations labeled P and T in the increasing order of ability to be deflected by an electric field. (1mk)
5. Identify the species that acts as a base in the reverse reaction given below. Give a reason. (2mks)



6. A given volume of ozone ( $\text{O}_3$ ) diffused from a certain apparatus in 96 seconds. Calculate the time taken by an equal volume of carbon(IV) oxide to diffuse under the same conditions. (C=12,O=16) (3mks)
7. The table below shows tests carried out in a separate sample of water drawn from a well and results obtained.

Test	Results
(i) Addition of excess aqueous ammonia	White precipitate
(ii) addition of a few drops of dilute sulphuric (IV) acid	No white precipitate formed
(iii) addition of dilute hydrochloric acid followed by a few drops of barium chloride.	White precipitate

Identify the cation and anion present in the water

Cation (1mk)

Anion (1mk)

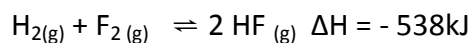
8. The table below shows the first ionization energies of elements A and B

What do these values suggest about reactivity of **B** compared to **A**? Explain  
(2mks)

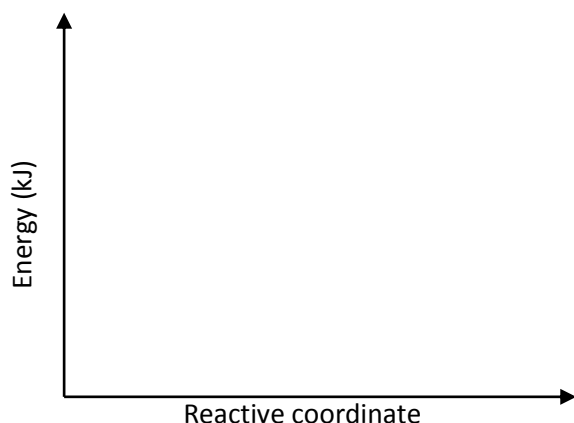
9. How would you obtain a sample of pure iodine and barium sulphate from a mixture of the two. (3mks)

10. Describe a simple laboratory experiment that can be used to distinguish between sodium sulphide and sodium carbonate. (2mks)

11. Hydrogen and Fluorine react according to the equation.



(a) On the grid provided below, sketch the energy level diagram for the reverse reaction. (1mk)



(b) Calculate the molar enthalpy of formation of HF (1mk)

12. Explain why burning magnesium continues to burn in a jar full of sulphur (IV) oxide while a burning wooden splint would be extinguished. (3mks)

13. An element Q has a relative atomic mass of 88. when a current of 0.5 amperes were passed through the fused chloride of Q for 32 minutes and 10 seconds. 0.44g of Q were deposited at the cathode. Determine the charge on the ion of Q. 1 faraday = 96500 C (3mks)

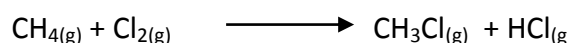
14. (a) what observations would be made if hydrogen sulphide gas was bubbled through a solution of Copper (II) sulphate. (1mk)

(b)

Element	Ionization energy KJ/Mol
A	500
B	740

Write an equation for the reaction that takes place in (a) above. (1mk)

15. Chlorine reacts with methane as shown below.



(a) What condition is necessary for this reaction to take place? (1mk)

(b) Identify the bonds which are broken and those that are formed.

(i) Bonds broken. (1mk)

(ii) Bonds formed. (1mk)

16. Aluminium chloride is slightly soluble in organic solvents whereas anhydrous magnesium chloride. Explain (2mks)

17. What is the colour of the following?

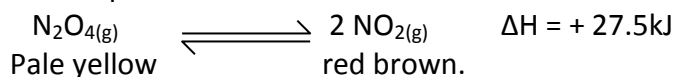
Metal oxide	Colour when hot	Colour when cold
Zinc oxide	(i)	(ii)
Lead (II) oxide	(iii)	(iv)

(4mks)

18. A concentrated solution of sulphuric (VI) acid contains 72.5% sulphuric (VI) acid. If the density of the acid is  $1.8 \text{ g/cm}^3$  determine the molarity of the acid solution. (H= 1, O=16, S = 32)

(3mks)

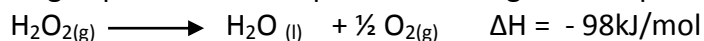
19. In a closed system an equilibrium exists between nitrogen(IV) oxide and dinitrogen tetraoxide as shown in the equation.



(a) State and explain the observation made when a glass syringe containing the equilibrium mixture is immersed in ice-cold water. (2mks)

(b) If the piston of the syringe is pushed state the effect on the position of the equilibrium. (1mk)

20. Hydrogen peroxide decomposes according to the equation shown below.



8.5g of hydrogen peroxide contained in 100cm<sup>3</sup> of solution with water were completely decomposed.

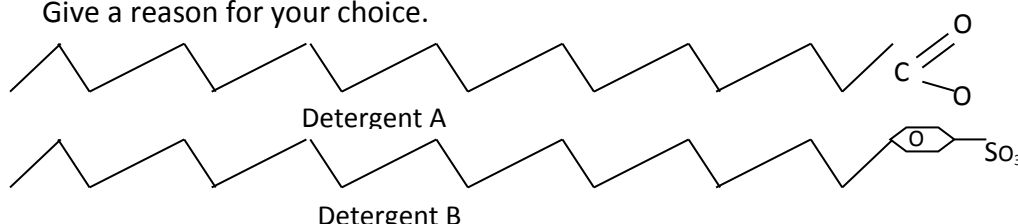
Calculate the rise in temperature due to the reaction. (specific heat capacity on water = 4.25g<sup>-1</sup>

21. Below is a table of first five alkanes and their boiling points.

Name	Boiling point °C
Methane	-161.5
Ethane	-88.5
Propane	- 42.1
Butane	-0.56
Pentane	36.1

(a) What is the state of pentane at room temperature ( 25°C)? Give a reasons. (2mks)

22. The diagram below shows two types of detergents which one of these detergents is a soap? Give a reason for your choice. (2mks)



23. Iron has two oxidation states, so it can form ions Fe<sup>2+</sup>. How can you test a solution to find out which ion is present. Outline the tests and give the results for both ions. (3mks)

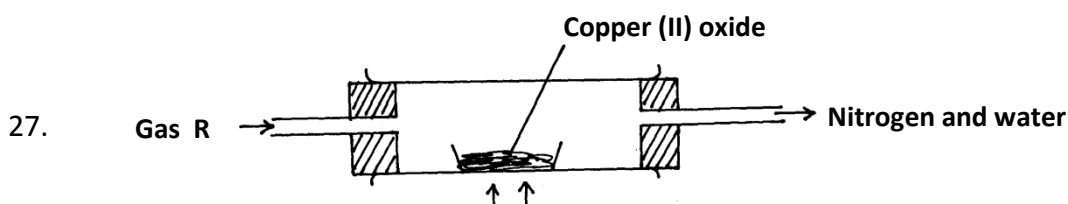
24. 5 g Sodium hydrogen carbonate were dissolved in 10cm<sup>3</sup> of water in a boiling tube. Lemon juice was then added dropwise with shaking until there was no further observable change.

(a) Explain the observation which was made in the boiling tube when the reaction was in progress. (2mks)

(b) What observation would have been made if the lemon juice had been added to copper turnings in a boiling tube. Explain (2mks)

25. 5.0g of calcium carbonate were allowed to react with 25cm<sup>3</sup> of 1.0m hydrochloric acid until there was no further reaction. Calculate the mass of calcium carbonate that remained unreacted. (Ca =40.0, O=16.0, C= 12.0) (3mks)

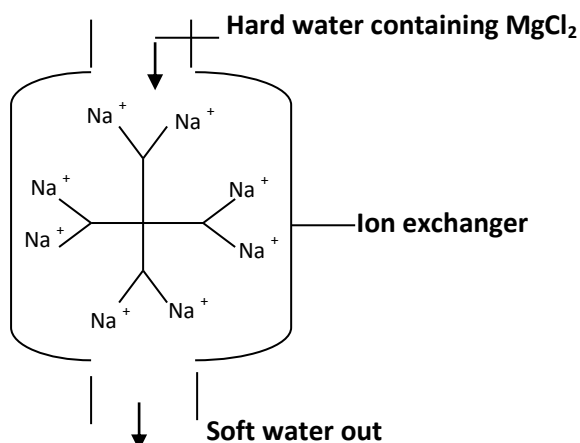
26. Construct a cell diagram fro a cell in which the following overall reaction takes place. ( 3mks)



**Heat**

The copper(II) oxide was converted to copper metal. Name the two diatomic gases that form R. (2mks)

28.



- (i) Draw the ion exchanger and show how it will appear at the end of softening process. (2mks)
  - (ii) How is the ion exchanger recharged after exhaustion (1mk)
29. The table below gives some properties of three metals: Aluminium, iron and copper. Use it to answer the questions that follow.

Metal	Density	Tensile Strength $10^{10}$ pa	Electrical conductivity
Aluminium	2.70	7.0	0.38
Iron	7.86	21.1	0.10
Copper1	8.92	13.0	0.59

Assuming that steel and stainless steel have similar properties to iron.

- (a) Why do some stainless steel sauce pans have a copper base? (1mk)
- (b) Aluminum with a steel core is used for overhead power cables in preference to copper. Why is aluminum preferred? (1mk)
- (c) Apart from over head power cables copper is chosen for almost all other electrical uses. Suggest **two** reasons for the choice of copper. (2mks)