KENYA NATIONAL EXAMINATION COUNCIL
REVISION MOCK EXAMS 2016
TOP NATIONAL SCHOOLS

ALLIANCE BOYS HIGH SCHOOL

233/1

CHEMISTRY

PAPER 2

TIME: 2 HOURS

SCHOOLS NET KENYA
Osiligi House, Opposite KCB, Ground Floor
Off Magadi Road, Ongata Rongai | Tel: 0711 88 22 27
E-mail:infosnkenya@gmail.com | Website: www.schoolsnetkenya.com

ALLIANCE BOYS HIGH SCHOOL KCSE TRIAL AND PRACTICE EXAM 2016

Paper 2

1. The table below shows the atomic numbers of some elements represented by letter J to Q (letters not their actual symbols). Study and answer the questions that follow.

Element	J	K	L	M	N	P	Q
Atomic Number	11	17	15	14	12	20	19

a) Write the electronic configuration of

(i) M (1mk)

(ii) P^{2+} (1mk)

b) Write the formula of the compound formed when **L** combines with **N** (1mk)

c) How would reactivities of element N and P with chlorine compare? Explain.(2mks)

d) Element **N** combines with oxygen to from an oxide. Using dots (•) and crosses(**x**) to represent the outermost electrons, show how the two elements combine. (2½mks)

e) Select the most reactive metal and non-metal and give reason for your answer. (2½mks)

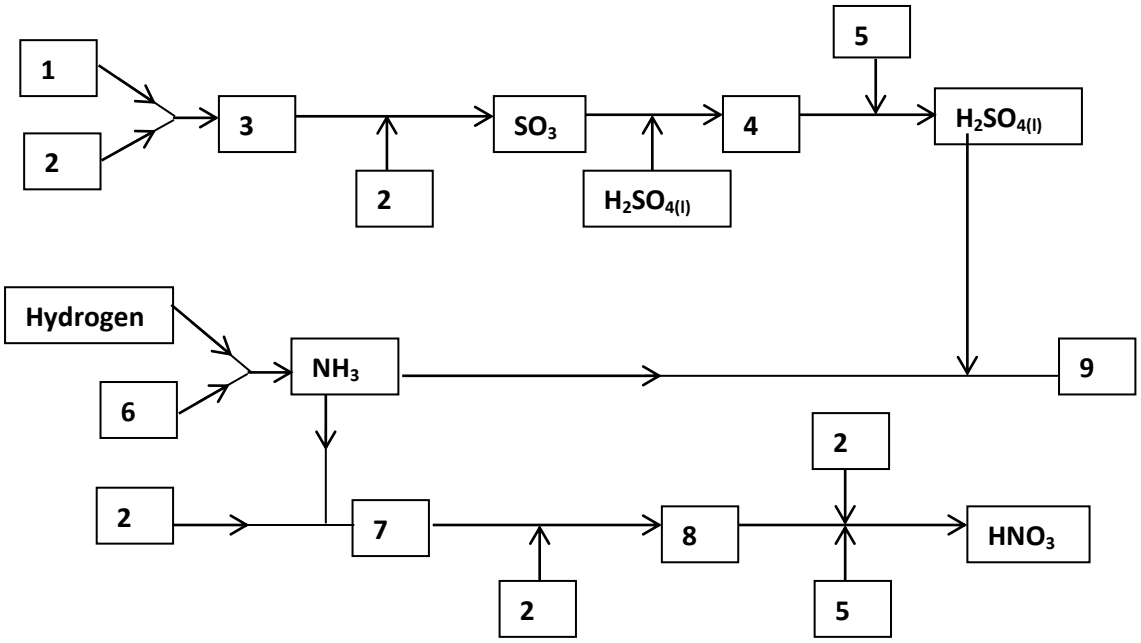
f) State **one** physical and one chemical property that elements **J** and **Q** have in common (2mks)

g) What name is given to the group of elements to which element **M** belong? (1mk)

h) (i) Element K consists of two isotopes with relative abundances 75% and 25% and mass number 35 and 37 respectively find the relative atomic mass of K. (2mks)

(ii) Why is the relative atomic mass of **K** not a whole number? (1mk)

2. The chart below shows some of the chemical needed for the production of ammonia gas, nitric acid and ammonia sulphate in the industry.



(a) Name the chemical that should be in chambers **1,2, 4, 6, 8** and **9** (3mks)

b) State **three** conditions required to convert the chemical substance in chamber 3 to $SO_{3(g)}$. (1½ mks)

c) Write balanced equations with conditions where necessary for the reactions that produces chemical substances in chambers:- (3mks)

d) Explain the following with the help of equations. When concentrated sulphulric acid is added to copper turnings and the mixture heated, a reaction takes places producing a blue solution as one of the products, but when dilute sulphuric acid is added to copper turnings there is no charge even after heating. (1½mks)

3. a) (i) Describe how Lead(II) nitrate is prepared in the Laboratory starting from Lead (II) Oxide. (3mks)

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

b) When Lead (II) nitrate crystals is heated strongly the crystals crackle and split because of the gas accumulating inside

(i) State **three** other observations that are made (3mks)

(ii) Write an equation for the reaction that takes place when Lead (II) nitrate is strongly heated. (1mk)

c) State and explain what is observed when solution is gradually added to a solution of Lead (II) nitrate until the alkali (ammonia) is in excess (2mks)

Observation:-

Explanation

d) Lead (II) ions react with iodide ions according to the equation

$$Pb^{2+}_{(aq)} + 2I^{-}_{(aq)} \longrightarrow PbI_{2(s)}$$

$300cm^3$ of 0.1M solution of iodide ions was added to a solution containing Lead (II) ions. Calculate the mass of Lead (II) iodide formed (Pb= 207, I = 127). (3mks)

4. (a) Name the following compounds. (2mks)

(i) $H_3C - CH_2 - CH - CH - CH_3$
with CH_3 on each of the two CH carbons:

```
H3C -  CH2  - CH  -   CH  - CH3
               |       |
              CH3     CH3
```

(ii)

```
CH3 - C  =  CH2
      |
     CH3
```

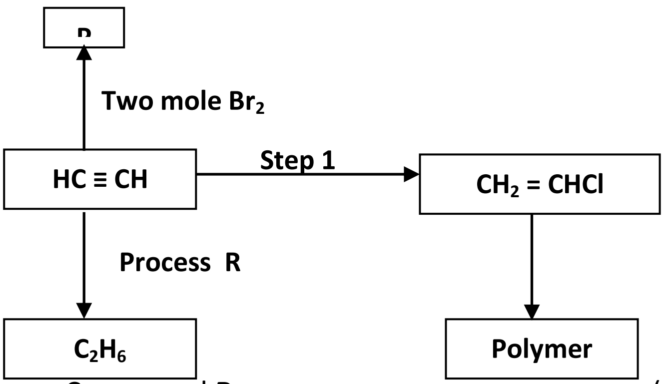
b) Propane can be changed into methane and ethane as shown in the equation below

$$CH_3\,CH_2CH_{3(g)} \xrightarrow{\text{High temp}} CH_{4(g)} + C_2H_{4(g)}$$

(i) Name the process undergone by propane (1mk)

(ii) Write an equation of reaction between ethene and chlorine gas and name the product. (2mks)

c) The scheme below represents some reaction involving hydrocarbons. Study it and answer the questions that follow.



(i) Name Compound **P**. (1mk)

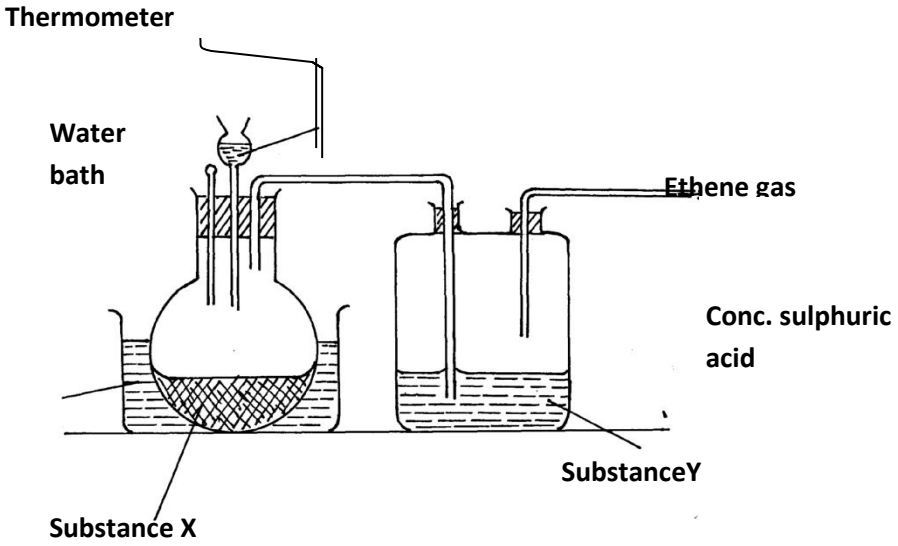
(ii) Draw the structural formula of **P**. (1mk

(iii) Name the reagent and type of reaction taking place in process **R**. (1mk)

(iv) What is a polymer. (1mk)

(v) Identify the reagent used in Step 1 (1mk)

d) The diagram below shows an incomplete set-up of the laboratory preparation and collection of ethene gas.

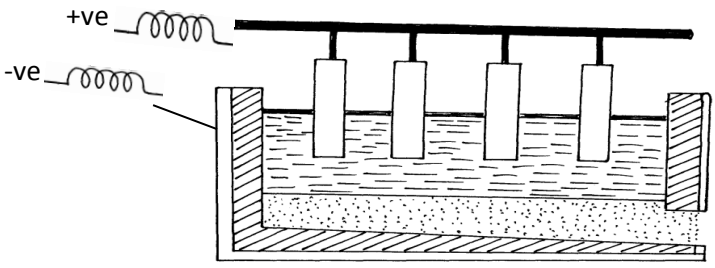


(i) Identify substances (1mk)

(ii) Complete the diagram to show how ethene gas is collected.(1mk)

(iii) Write the equation of the reaction which forms ethane gas in the above experiment (1mk)

5. a) The extraction of aluminum from it's ore takes place in two stages. Purification stage and electrolysis stage. The diagram below shows the Hall's cell for the electrolysis stage.



a) Name the chief ore from which aluminium is extract (½ mk)

b) Name an impurity which is removed at the purification stage (1mk)

c) Label on the diagram the anode, the cathode and region containing the electrolyte. (1½ mks)

d) The melting point of aluminium oxide is 2054^{o}C but the electrolysis is carried out at temperature between 800^{o}C – 900^{o}C.

(i) What is done to lower the temperature? (1mk)

(ii) The aluminium produced is tapped out as liquid, what does this suggest about its boiling point? (1mk)

e) Write down the half-cell reaction at the Cathode. (1mk)

f) A typical electrolysis cell uses a current of 40,000 A, Calculate the mass in Kg of aluminium produced in One hour. (IF = 96500C,Al=27) (3mks)

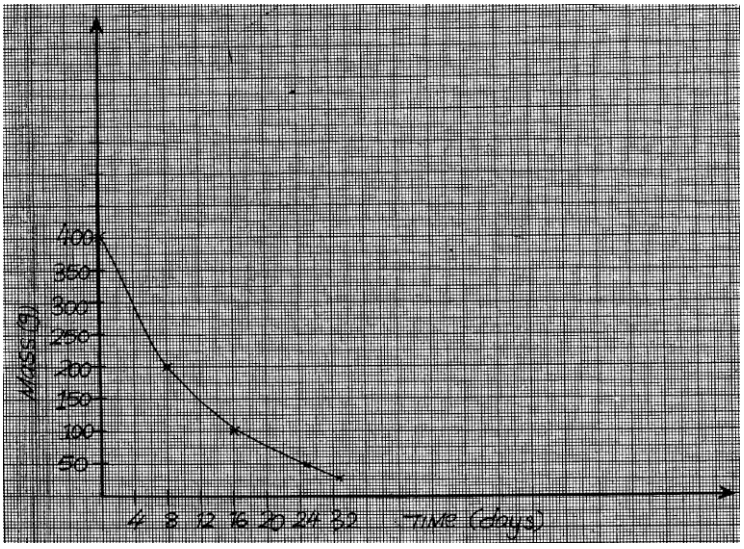
g) A part from making cooking utensils state two other uses of aluminium (2mks)

6. Define the following terms

(i) Nuclear fission (1mk)

(ii) Nuclear fussion. (1mk) b)

The graph below shows the decay for a sample of 400g of iodine -131. Study is and answer question that follow.



Decay curve of Iodine 13%

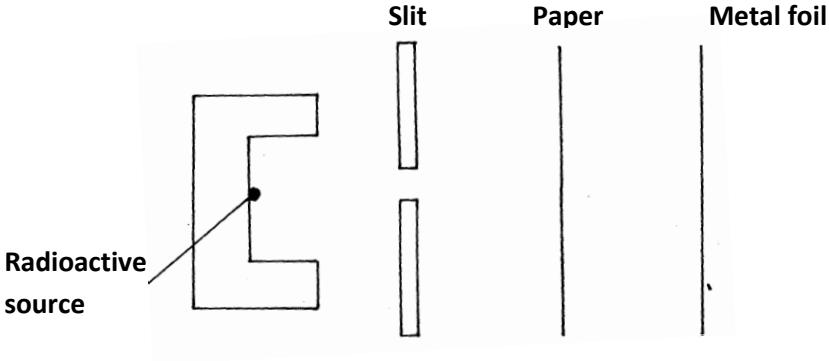
(i) Use the graph to determine the half-life of the sample (1mks)

(ii) Using a dotted line extend the graph to show what eventually happens if the sample continues decaying. (1mk)

(iii) Define the radioactive decay (1mk)

(iv) What fraction of the original sample remains after 16.2 days. (2mks)

(c) (i) Alpha (α) and Beta (β) particles can be distinguished using paper and metal foil.



Complete the diagram below to show how this is done. (2mks)

ii) Below is radioactive decay series starting from $^{210}_{Pb}$ and ending at $^{206}_{Pb}$

$$^{210}_{Pb} \xrightarrow{\text{Step 1}} {}^{210}_{Bi} \xrightarrow[\text{Step 11}]{\text{Step 11}} {}^{210}_{Pb} \xrightarrow{\text{Step 111}} {}^{206}_{Pb}$$

(i) Identify the particles emitted at step I and step II (2mks)

(ii) Write nuclear equations for reaction which takes place at step III (1mk)

e) 50g of a radioisotope $^{233}_{Pa}$ was reduced to 6.25g after 45.5 days. Determine the $^{233}_{Pa}$ half-life of

(2mks)

f) State **two** ways in which radioisotopes poses danger to the environment.

(2mks)