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INDEX NO:.....

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233/1

CHEMISTRY

PAPER I

(THEORY)

JULY/AUGUST - 2012

TIME: 2 HOURS

MANGA DISTRICT JOINT EVALUATION EXAM– 2012

Kenya National Examination Council (K.C.S.E)

233/1

CHEMISTRY

PAPER I

(THEORY)

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INSTRUCTIONS TO CANDIDATES

- Write your name and Index number in the spaces provided.
- Sign and write the date of examination in the spaces provided.
- Answer ALL questions in the spaces provided
- Mathematical tables and silent electronic calculators may be used.
- ALL working MUST be shown clearly where necessary
- Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.

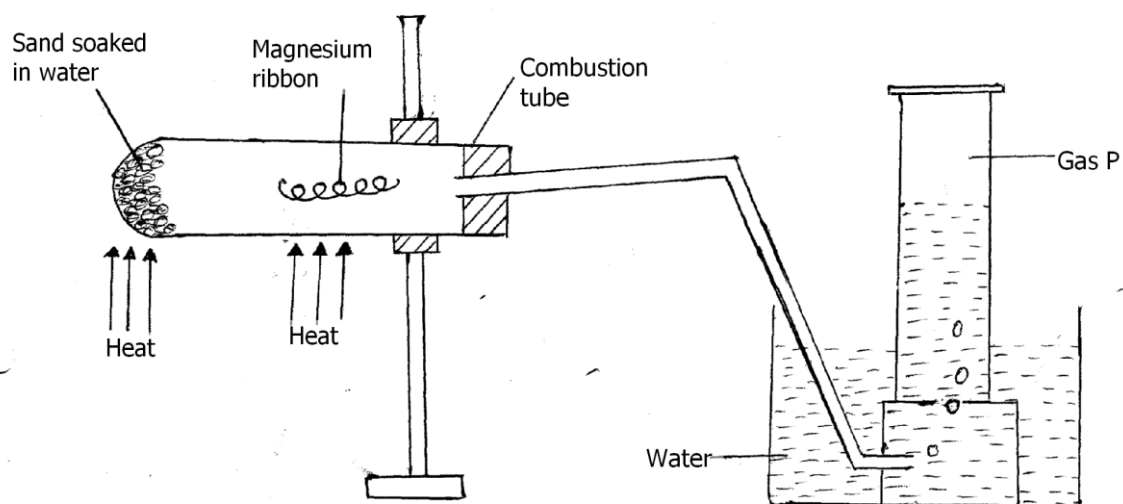
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QUESTIONS	MAXIMUM SCORE	CANDIDATES SCORE
1 – 27	80	

This paper consists of 12 printed pages.

Candidates should check the question paper to ascertain that all pages are printed as indicated and that no questions are missing.

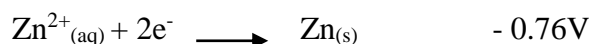
5. The set-up in the diagram below was used to study the reaction between magnesium ribbon and steam. Study it and answer the questions that follow.



- (a) (i) Identify gas P. (1mk)
 P.....
- (ii) Explain why it is possible to collect gas P by the method shown. (1mk)

- (b) Write the chemical equation for the reaction which took place in the combustion tube. (1mk)

6. The following are half-reactions for some half-cells and their respective reduction potentials.



- (a) Write the overall cell equation for two half-cells which will give the highest e.m.f. (1mk)

- (b) Calculate the e.m.f of the cell in (a) above. (2mks)

7. Oxygen gas can be prepared in the laboratory by catalytic decomposition of hydrogen peroxide.
- (a) Write the chemical equation for the reaction. (1mk)

- (b) State the name of the suitable catalyst used. (1mk)

- (c) Give one industrial use of oxygen (1mk)

8. 9.12g of a gaseous compound contain 8g of silicon while the rest is hydrogen. Determine the empirical formula of the compound. (H = 1, Si = 28) (3mks)

9. 12.0cm³ of 0.05m hydrochloric acid reacted with calcium hydrogen carbonate to form calcium chloride, water and carbon IV oxide.
- (a) Write the chemical equation for the reaction. (1mk)

- (b) Calculate the number of moles of hydrochloric acid used. (1mk)

- (c) Determine the number of moles of calcium hydrogencarbonate used. (1mk)

10. The table below shows the solubility of a substance at various temperatures. Study it and answer the questions that follow.

Temperature (°C)	Solubility in g/100g of water
0	36
40	30
80	25
110	20

- (a) What is the meaning of solubility? (1mk)

(b) What is the physical state of the substance? (1mk)

.....
(c) State and explain what would happen if a sample of a saturated solution of the substance at 40⁰C was heated to 110⁰C. (2mks)
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11. Explain each of the following observations.

(a) Soft drinks fizz when the cap is removed from the bottle. (1mk)

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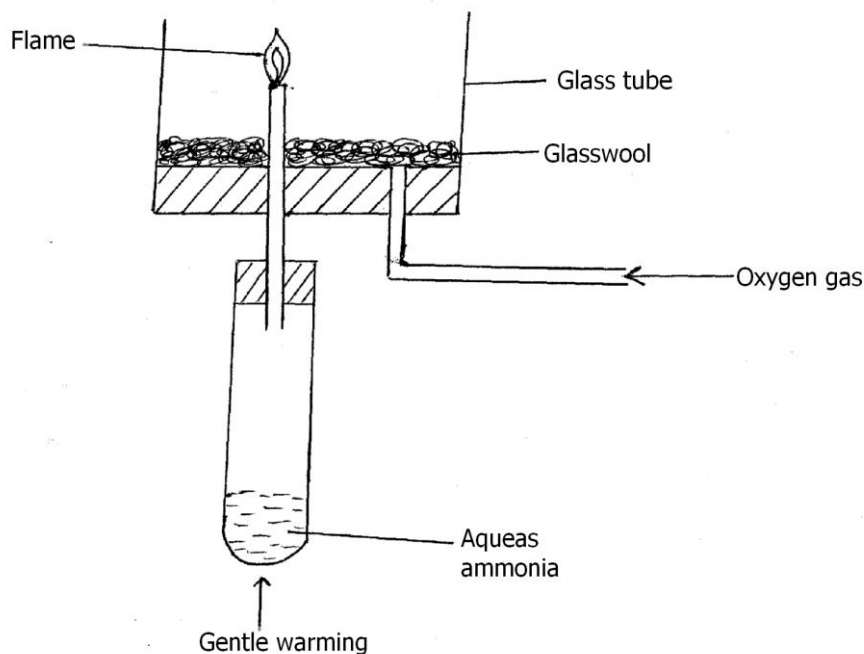
(b) Diamond does not conduct electricity while graphite does. (1mk)

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(c) Pure nitric V acid is colourless but during its laboratory preparation, it appears yellow. (1mk)

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



(a) Why is aqueous ammonia warmed gently? (1mk)

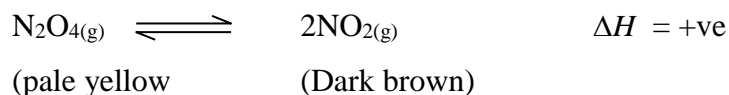
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(b) What is the colour of the flame? (1mk)

.....

(c) Write the chemical equation for the reaction that takes place. (1mk)

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13. The dissociation of dinitrogen tetraoxide to nitrogen IV oxide can be represented by the equilibrium equation shown below.



(a) What information does ΔH convey about the equilibrium equation? (1mk)

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(b) If the mixture of the two gases is at equilibrium in a closed system, what would be observed when:-

(i) the mixture is cooled (1mk)

.....

(ii) the pressure of the mixture is decreased. (1mk)

.....

14. The molecular formula of a hydrocarbon is $\text{C}_{11}\text{H}_{24}$.

The hydrocarbon can be converted into other hydrocarbons as shown below.



(a) Name process R. (½ mk)

R.....

(b) Draw the structural formula of Y and give its name. (1½ mks)

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(c) Write the chemical equation for the complete combustion of C_6H_{14} . (1mk)

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15. An element X forms an ion X^{2-} with electron arrangement 2.8.8.

(a) Write the electron arrangement of element X. (1mk)

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(b) Write the formula of the compound formed when element X reacts with lithium.
(Li = 3) (1mk)

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(c) Draw a dot (•) and cross (x) diagram to represent the compound formed in
(b) above. (1mk)

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16. An atom of hydrogen can form the ions. Write two equations to show how a neutral
Atom of hydrogen can form two ions. In each case, show the sign of the energy change
involved. (3mks)

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17. 5.34g of a salt of formula M_2SO_4 was dissolved in water. The sulphate was precipitated
By adding excess barium chloride solution. The mass of the precipitate formed was
4.66g. (Ba = 56, S = 32, O = 16).

(a) Calculate the number of moles of sulphate ions present. (1mk)

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(b) Evaluate the relative atomic mass of M in M_2SO_4 . (2mks)

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18. Polyvinyl chloride (PVC) is an example of an addition polymer whose monomer is Chloroethene.

(a) What is a polymer? (1mk)

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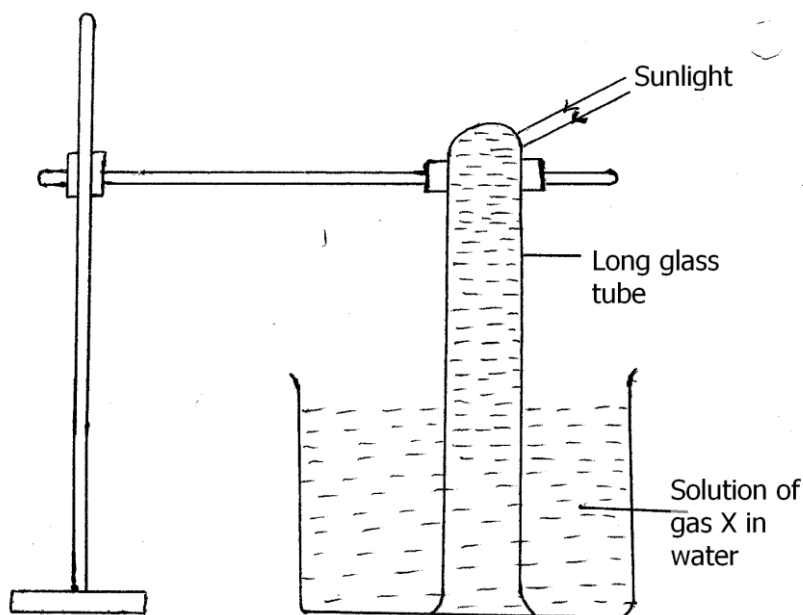
(b) What is meant by addition polymerisation? (1mk)

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(c) Using $2n$ molecules, draw the structure of PVC. (1mk)

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19. Gas X prepared by reacting concentrated hydrochloric acid and potassium manganate VII, was bubbled through water. The solution formed was exposed to sunlight as shown Below.



(a) Name gas X. (½ mk)

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(b) State the observation made in the set-up after some time. (1mk)

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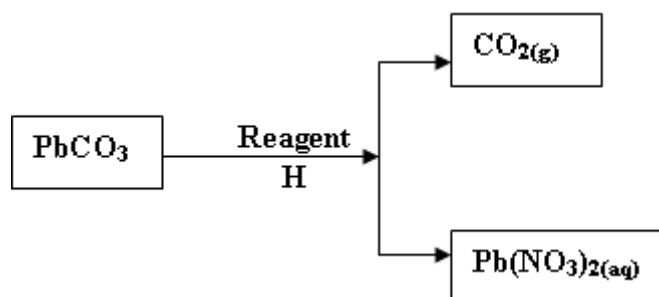
(c) State and explain what happens when a piece of blue litmus paper is placed in the aqueous solution of gas X. (1 ½ mk)

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24. The table below shows the atomic numbers of elements T, U, V and W. Study it and answer the questions that follow. The letters are not the actual symbols of the elements.

Element	T	U	V	W
Atomic number	13	16	17	20

- (a) What type of bond would be formed between:-
- (i) elements U and W (1mk)
-
- (ii) elements V and U (1mk)
-
- (b) Which of the elements are metals. (1mk)
-
25. Study the reaction scheme below and answer the questions that follow.



- (a) Identify reagent H. (1mk)
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- (b) Write the chemical equation for the reaction between lead II carbonate and reagent H. (1mk)
-
- (c) State the test for the gaseous product of the reaction. (1mk)
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26. Students are advised to use a non-luminous flame for heating in the laboratory.
- (a) How does a Bunsen burner produce a non-luminous flame? (1mk)
-
- (b) Give one reason why the advice is given to students. (1mk)
-
27. One of the four types of oxides is amphoteric oxide.
- (a) What is an amphoteric oxide? (1mk)
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(b) Write the formulae of any two amphoteric oxides. (1mk)

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