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The Sign of Knowledge
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Name: ……Index No. ……
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Date: …….....

233/1
CHEMISTRY
PAPER 1
FORM IV
PRE-MOCKS
Time: 2 hours

BRILLIANT PUBLISHERS PRE-MOCK 2020

Kenya Certificate of Secondary Education (K.C.S.E.)
233/1
CHEMISTRY
FORM IV

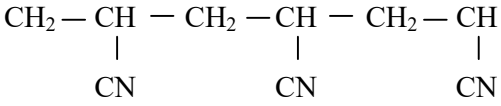
INSTRUCTIONS TO THE CANDIDATES:-

- Write your **name** and **index number** in the spaces provided.
- Answer ***all*** the questions in the spaces provided.
- Mathematical tables and electronic calculators may be used
- All working **MUST** be clearly shown where necessary.

Question	Maximum score	Candidate's score
1-30	80	

This paper consists of 8 printed pages. Candidates should check to ascertain that all pages are printed as indicated and that no questions are missing

1. A polymer has the following structure



A sample of this polymer is found to have a molecular mass of 5194. Determine the number of monomers on the polymer.
(H = 1.0, C = 12.0, N = 14.0) (2mks)

2. An element Y has the electronic configuration 2.8.5
a) Identify its period _____ (1mk)

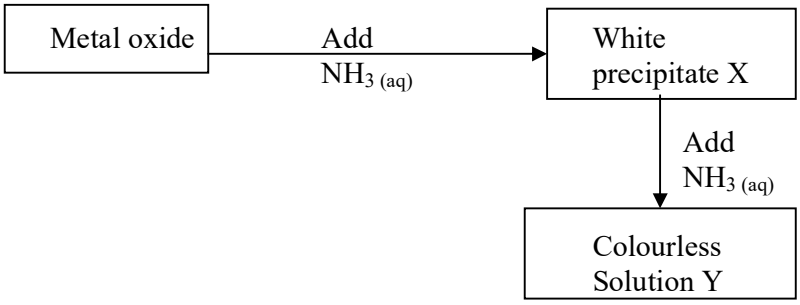
b) Write a formula of the most stable anion formed when U ionizes. (1mk)

c) Explain the differences between the atomic radius of element Y and its ionic radius. (2mks)

3. The following two tests were carried out on chlorine water contained in two test-tubes.
(a) A piece of blue flower was dropped into the first tube. Explain why the flower was bleached. (1mk)

(a) The second test-tube was corked and exposed to sunlight. After a few days it was found to contain a gas that rekindled a glowing splint. Write an equation for the reaction which produced the gas. (1 mk)

4. Study the flow chart below and answer the questions that follow.



a) Identify the metal oxide. (1mk)

b) Write an ionic equation leading to the formation of the white precipitate X. (1mk)

c) Give the formula of the ions responsible for the colourless solution Y. (1mk)

5. a) Give the structural formula of 3,3-dimethly pent-l-yne (1mk)

b) Name the following compounds using the IUPAC system. (2mks)

i) $CH_3 - C(=CH_2) - CH_2 - CH_3$

(ii) $CH_3\,CH_2\,CH(Br)\,C(CH_3)=CH_2$

6. Explain the following observations.

a) When lead (II) carbonate reacts with dilute hydrochloric acid, very little carbon (IV) oxide is produced (2mks)

b) When hydrogen chloride gas is dissolved in water the solution formed turns blue litmus paper red but there is no effect on blue litmus paper when the gas is dissolved in carbon tetra chloride. (CCl_4) (2mks)

7. $20cm^3$ of an unknown gas Q takes 12.6 seconds to pass through small orifice.$10cm^3$ of oxygen gas takes 11.2 seconds to diffuse through the same orifice under the same conditions of temperature and pressure .Calculate the molecular mass of unknown gas Q (O=16) (3mks)

8. A compound of carbon, hydrogen and oxygen contains 71.12g by mass of oxygen, 2.2g hydrogen and the rest is carbon. It has relative molecular mass of 90.

a) Determine the empirical formula of the compound. (2mks)

b) Determine the molecular formula of the compound. (2mks)

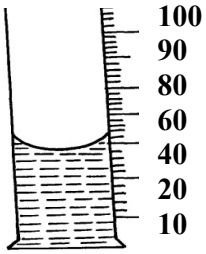
9. Study the information in the table and answer questions that follow:

Isotope	Relative abundance %
$^{69}_{31}R_1$	61.3
$^{71}_{31}R_2$	38.7

(a) Determine the number of neutrons of R_1 (1mk)

(b) Calculate the relative atomic mass of element **R**. (2mks)

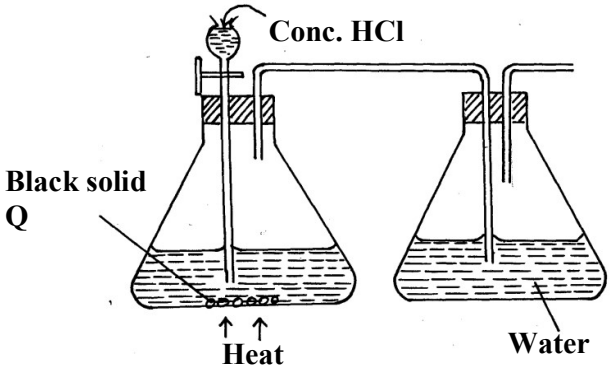
10. In an Experiment, concentrated sulphuric acid was put in a beaker and exposed to air for one week as shown below.



(i) What observation was made after one week? Explain. (2mks)

(ii)What property of sulphuric acid was being investigated in the experiment? (1mk)

11. The diagram shows an incomplete set-up for the laboratory preparation and collection of chlorine gas. Study it and answer the questions that follow.



(a) Complete the set-up to show how dry chlorine gas is collected. (2mks)

(b) Name substance Q. (1mk)

12. Identify the type of bond formed in (i) and (ii). (2mks)

(I) (II)

(I)……..

(II)……..

13. When magnesium was burnt in air, a solid mixture was formed. On addition of water to the mixture a Gas which turned moist red litmus paper blue was evolved. Explain these observations.
(2mks)

14. Complete the table below. (2mks)

Element	Latin Name	Symbol
_____	Plumbum	_____
Copper	_____	Cu
Potassium	_____	K

15. When air is bubbled through pure water (PH=7) the PH drops to 6.0. Explain. (2 mks)

16. Calculate the mass of sulphur which on complete combustion would yield $7dm^3$ of sulphur (IV) oxide measured at 182^oc and 722 mm Hg pressure.
(0=16, S=32, molar gas volume = $24dm^3$ at r.t.p) (3 mks)

17. If $25.0cm^3$ of 0.1 M H_2SO_4 solution neutralized a solution containing 1.06g of sodium carbonate in $250cm^3$ of solution, calculate the molarity and volume of the sodium carbonate solution used.
(3mks)

18. (i) State Charles' law. (1mk)

(ii) The capacity of a balloon to hold a gas at $5^{o}c$ is $1dm^{3}$ before it bursts due to expansions show whether it will burst or not at $35^{o}c$ at constant pressure. (2mks)

19. 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)

20. Form two students from Wangai secondary school reacted three elements as shown in the table below

Element	Reaction with Oxygen	Reaction with water
X	Formed acidic oxide	No reaction
Y	Formed basic oxide	Formed soluble hydroxide gave off hydrogen gas
Z	Formed acidic oxide	Dissolved to form an acidic solution

Which element (s) is likely to be: (3mks)

i) Non-metal (s)

ii) Metal (s)

iii) Insoluble in water

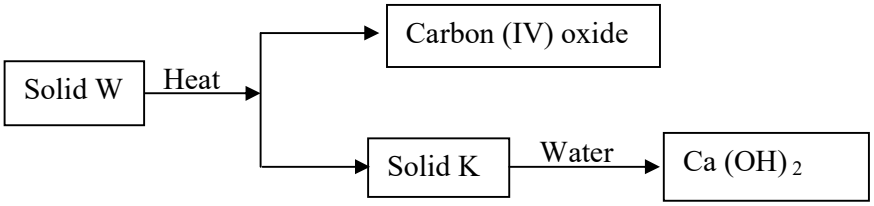
24. State the function of the following parts of a Bunsen burner (3mks)

a) Air hole

b) Collar

c) Base

21. Study the scheme below and answer the questions that follow



a) Identify solids

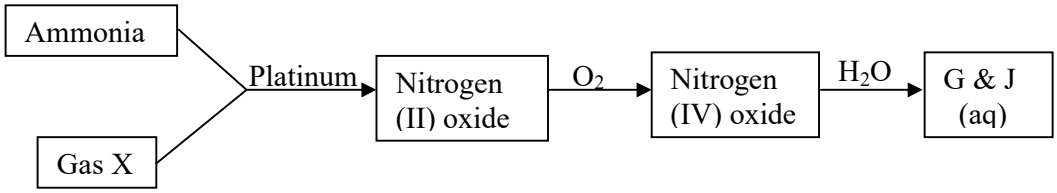
W –

K – (2mks)

b) Write an equation for the formation of $Ca(OH)_2$ from solid K (1mk)

c) Write an equation for the decomposition of solidW (1mk)

22. Study the flow chart below and answer the questions that follow

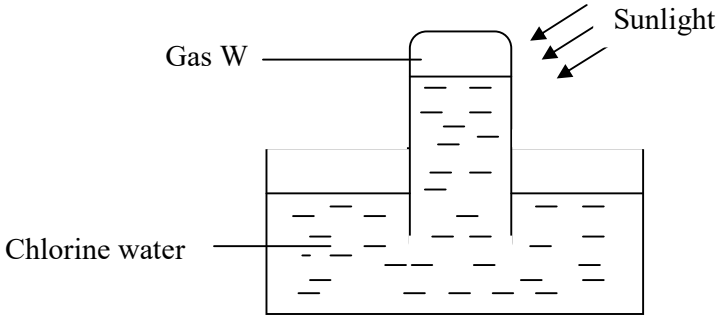


a) Identify gas X (1mk)

b) Write an equation for the reaction between ammonia and gas X (1mk)

c) Write an equation to show the formation of G and J (1mk)

23. The diagram below shows the effect of sunlight on chlorine water



a) Identify gas W (1mk)

b) Write an equation to show the formation of gas W (1mk)

c) What compounds are present in chlorine water? (1mk)

d) Which compound is left in the beaker after complete formation of gas W? (1mk)

24. Study the table below and answer the questions that follow

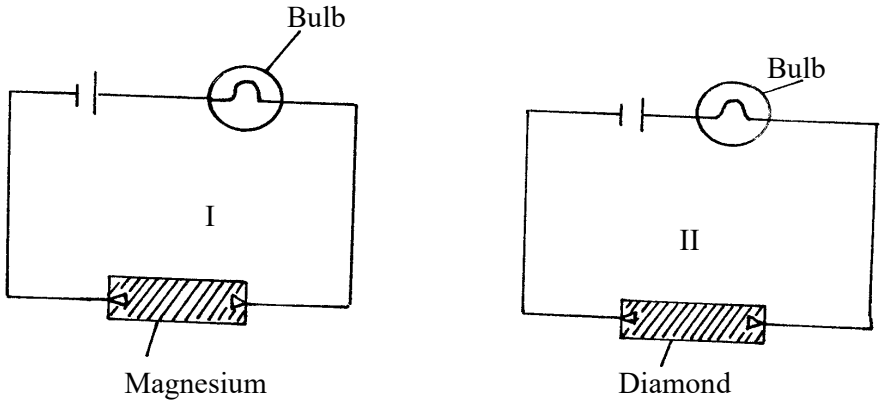
Element	Atomic number	Atomic radius	Ionization energy
K	3	0.089	1800
V	11	0.136	1450
T	19	0.174	1150

a) Explain the trend in the ionization energy from element K to T (2mks)

b) In which group of the periodic table do the above elements belong? Explain (2mks)

25. Explain using chemical means how you will differentiate between carbon (II) oxide and carbon (IV) oxide. (2mks)

26. The following set-ups were used by form two students to investigate electrical conductivities of two substances. Study and use it to answer the questions that follow.



State the observations made in set up I & II above (2mks)