

**ASUMBI GIRLS HIGH SCHOOL
TERM 2 – DECEMBER 2021
FORM 4**

CHEMISTRY PAPER 1

Name: Adm No:

Class: Candidate's Sign:

Date:

233/1
CHEMISTRY
PAPER 1

TIME: 1 HOUR



Kenya Certificate of Secondary Education (K.C.S.E.)

FORM FOUR

Chemistry
Paper 1

INSTRUCTIONS TO THE CANDIDATES:-

- Write your **name** and **Admission 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.

For Examiner's Use Only:

Question	Maximum score	Candidate's score
1-25	80 MARKS	

1 [a] State Boyle's law [1mk]

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[b] At 400⁰C, 850cm³ of a gas exert a pressure of 560mmHg. What volume of the same gas would exert a pressure of 640mmHg at the same temperature? [3mks]

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2. When burning magnesium is lowered into a gas jar containing nitrogen (I) oxide, it continues to burn forming a white solid

[a] Name the white solid [1mk]

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[b] Write a chemical equation of the reaction that occurred [1mk]

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3. Carbon {IV} oxide is one of the gases used in fire extinguishers

[a] State any other possible use of carbon {IV} oxide [1mk]

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[b] Name any two reagents that can be reacted together to generate carbon {IV} oxide [2mks]

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4. Rusting is a process that causes massive destruction of iron structures

[a] State one condition that accelerates rusting [1mk]

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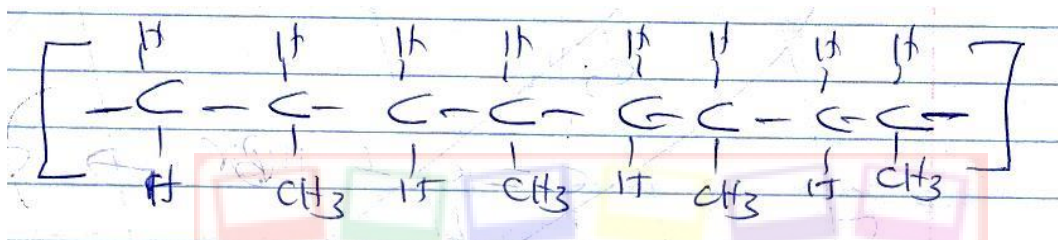
[b] State one advantage of rusting

[1mk]

5. At 60°C, 38 grams of lead{II} nitrate saturate 56cm³ of water. Determine the solubility of lead {II} nitrate at this temperature [2mks]

6. Explain why molten sodium chloride conducts electricity, but solid sodium chloride does not [2mks]

7. A polymer can be represented as



[a] Name and draw the structure of the monomer [2mks]

[2mks]

[b] What type of polymerization occurs in the above case? [1mk]

[1mk]

[c] Given that the molecular mass of the polymer is 25620, how many units of the monomer make the polymer [2mks]

[2mks]

8. A reaction can be represented as;



Given the bond energies of C-H, C=C, C-C, C-Br, and H-Br as 20kJ/mol, 580Kj/mole, 446Kj/mole, 438KJ/mole and 396kJ/mole respectively. Determine the heat of formation of C₂H₅Br [3mks]

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9 [a] Define the term, dynamic equilibrium [1mks]

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[b] A reaction at equilibrium can be represented as



Yellow orange

State and explain the observation made when;

[i] NaOH is added to the equilibrium mixture [2mks]

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[ii] HCl is added to the equilibrium mixture [2mks]

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10. During the electrolysis of dilute copper {II} chloride using carbon electrodes, a current of 1.5A was passed through the solution for 2 hours and 30 minutes

[a] Write the ionic equation of the reaction that occurred at the cathode [1mk]

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[b] Given R.A.M of copper = 64 and 1F = 96500C, calculate the change in mass of the cathode [3mks]

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11. [a] Define the term half-life [1mk]

[b] Name two particles likely to be emitted when a radioactive nuclide undergoes radioactivity [2mks]

[c] The half-life of a radioactive nuclide is 3 hours. Given that its initial mass is 288g, determine the remaining mass after 12 hours. [2mks]

12. The reduction potentials of elements M and N are;



Using the above reduction potentials, predict whether a reaction would occur between $N^+_{[aq]}$ and $M_{[s]}$ [3mks]

13. An hydrocarbon can be represented as: C_2H_2

[a] Name the hydrocarbon [1mk]

[b] State two reagents that can be reacted together to generate the hydrocarbon [2mks]

[c] Identify the group of hydrocarbons into which C_2H_2 belongs to [1mk]

14. [a] Name two allotropes of sulphur [2mks]

[b] In an experiment to investigate a certain property of sulphur, Maina added few drops of conc HNO_3 to sulphur in a test tube and warmed the mixture

[i] State one observation made [1mk]

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[ii] Write a chemical equation of the reaction that occurred [1mk]

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15. Chlorine is commonly used in the manufacture of $\text{Ca}(\text{OCl})_2$

[i] State one use of the above compound of chlorine [1mk]

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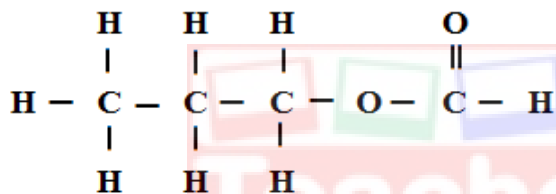
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[ii] Write a chemical equation leading to the production of $\text{Ca}(\text{OCl})_2$ [1mk]

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16. A compound can be represented as



[a] What name is given to the above class of compounds [1mk]

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[b] Name two reagents that can be reacted together to generate the above compound [2mks]

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[c] State two conditions necessary for the reaction leading to formation of the above compound to occur [2mks]

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17. Using dots and crosses, show bonding in carbon{II} oxide [2mks]

18. When 20g of a compound containing carbon, hydrogen and oxygen was burnt in the air, 29.3g of carbon{IV} oxide and 11.7g of water were produced. Determine its empirical formulae.
 {C=12, H=1 , O=16} [3mks]

19. Few drops of hydrochloric acid were added into a test tube containing lead {II} Nitrate solution
 {a} State one observation made [1mk]

{b} Write an ionic equation of the reaction that occurred in the test tube [1mk]

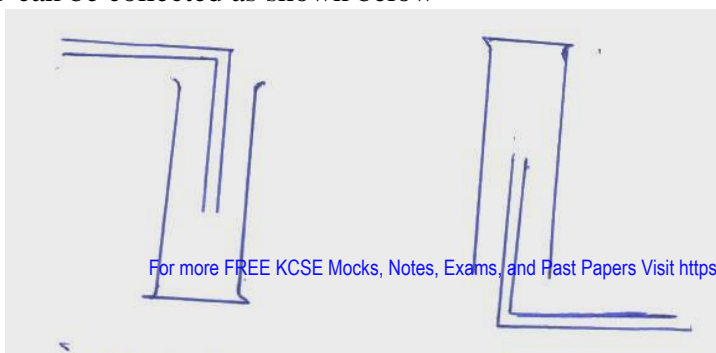
20. In the industrial manufacture of Ammonia one of the raw materials is nitrogen gas
 {a} Name one other raw material [1mk]

{b} Name two possible sources of the raw material you have named in {a} above [2mks]

{c} Name two substances that can be used as catalyst in this process [2mks]

{d} State one use of ammonia [1mk]

21. Gas X and Y can be collected as shown below



[a] Name the method used to collect gas Y [1mk]

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[b] How do densities of gas X and gas Y compare? [1mk]

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[a] Give an example of a gas that can be collected using the same method as gas Y [1mk]

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22. Element W has two isotopes W – 36 and W-40 which occur in the ratio x:4. Given that R.A.M of W is 37.25, find the value of x [2mks]

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23. Describe an experiment that can be used to determine whether a given sample of a liquid is pure [2mks]

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24. A given mass of gas T diffuses through a porous plug in 48 seconds while a similar mass of gas R diffuse in 70 seconds. Given that the density of gas T is 0.6g/cm³, find the density of gas R [2mks]

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25. The electron configuration of elements A, B, C, D and E are as given below

Element	Electron configuration
A	2, 8, 1
B	2, 8
C	2, 7
D	2, 8, 6

E	2, 8, 3
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{a} Which element has the highest electrical conductivity [1mk]

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{b} Which letter represents the most reactive metal [1mk]

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{c} Which letter represents the most reactive non-metal [1mk]

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