**MALAIKA SECONDARY SCHOOL**

**FORM THREE OPENING EXAM**

**CHEMISTRY**

**Time: 3Hours , 2024**

**Instructions**

1. This paper consists of sections **A , B and C**  with a total of **eleven (11)** questions
2. Answer all questions form section **A** and **B** and only **two (2)** questions from section **C**
3. Section **A** carries sixteen (16) marks, section **B** carries **fifty four (54)** marks and section **C** carries **thirty (30)** marks.
4. All writings must be in blue or black ink with exception of diagrams which must be done in pencil
5. Cellular phones and any unauthorised materials are not allowed in the examination room
6. Remember to write your Name and stream on every page of your answer sheet(s)
7. Whenever necessary use the following constants

1 faraday = 96500C

1 litre =1dm3 = 1000cm3

Avogadro’s constant =

G.M.V. at S.T.P. = 22.4 dm3

Standard pressure = 760mmHg

Standard temperature = 273K

Atomic masses

**SECTION A (15 Marks)**

**Answer all questions in this section**

1. For each of the items (i) – (x), choose the correct answer form among the given alternatives and write its letter beside the item number in the booklet provided.
2. Which is a chemical property of water?
3. It is very good solvent
4. It is neither acidic nor basic
5. It has higher surface tension
6. It can exist in three states of matter
7. It expands when it freezes
8. What is the maximum number of electrons in the outermost shell of atoms?
9. 3 B. 1 C. 4 D. 2 E. 8
10. What feature is essential for a good fuel?
11. High speed of continuous energy supply
12. High energy value supplied
13. Low carbon dioxide supplied
14. High carbon dioxide production
15. High content of non –combustible material
16. Which energy source that can be reused after being exploited?
17. Combustible source
18. Non – renewable source
19. Renewable source
20. Synthetic source
21. Natural source
22. Which of the following is not a component of First Aid kit?
23. Goggles
24. A pair of scissors
25. Knife
26. Gloves
27. Razor blade
28. Which element is oxidized in the following reaction?

2FeSO4 + Cl2+H2SO4 Fe2 (SO4)3 + 2HCl

1. Chlorine
2. Hydrogen
3. Oxygen
4. Sulphur
5. Iron
6. Which of the following are the components needed to start fire?
7. Match box, fire wood and kerosene
8. Match box, fire wood and oxygen
9. Oxygen, fuel and fire wood
10. Oxygen, heat and match box
11. Oxygen, fuel and heat
12. Why is nitrogen formed first during the fractional distillation of air?
13. It has got high boiling point
14. It has got low density
15. It has got low melting point
16. It has got high density
17. It has got low boiling point
18. What conclusion can be drawn from the random movement of pollen grains suspended in air?
19. Matter is lighter in nature
20. Matter is sold in nature
21. Matter is particulate in nature
22. Matter is gaseous in nature
23. Matter is wave in nature
24. The primary factor which determines all three states of matter is
25. Temperature
26. Particles
27. Molecules
28. Ions
29. Kinetic theory of matter
30. Match the List A with the response in List B by writing the letter of the correct answer beside the item number in the answer sheet(s) provided.

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| --- | --- |
| **LIST A** | **LIST B** |
| 1. Potassium permanganate 2. Dilute acids 3. Concentrated acids 4. Dynamite 5. Petroleum 6. Uranium | 1. Radioactive 2. Oxidant 3. Flammable 4. Irritant 5. Corrosive 6. Explosive 7. Fragile 8. Biohazard |

**SECTION B (54 Marks)**

**Answer all questions in this section**

1. (a) Ion exchanger is used in water purification (removing hardness)
2. Name the ion which put in exchanger resins**(01mark)**
3. When the ion which put in the Cation exchanger is exhausted, name the solution which should be added to replace the exhausted ion.**(01mark)**
4. Draw a simple diagram of the ion exchanger.**(03marks)**

(b) Relate the following physical properties of water to its daily application in real life situation

1. Colourless**(02marks)**
2. Tasteless **(02marks)**
3. (a) An element with electronic configuration 2:8:2 burns in carbon dioxide gas to form white solid and black solid spacks. The white solid dissolves in nitric acid leaving colourless solution R.
4. Write balanced equations for the formation of colourless solution R**(02marks)**
5. Identify the three chemical tests of solution R**(03marks)**

(b) Consider the following substances, milk, copper, soap, steel, chlorine and sugar

1. Identify the elements, compounds and mixture from the list**(04marks)**
2. Mr Mapunda performed an experiment after being given the following
3. Painted nail
4. Unpainted nail
5. Boiled water

In his experiment he put both nails in a beaker contained boiled water and he covered the beaker after he put the nails in the beaker.

1. Questions
2. Do you think which nail got rust? Give reason for your answer.**(02marks)**
3. Explain, what if unboiled water could be used in the experiment**(01mark)**
4. Do you think Mr. Mapunda succeeded what he wanted to test for? If yes or no give reason to support your answer **(02marks)**
5. Explain in short four qualities of good chemistry laboratory**(04marks)**
6. Study the diagram below and then answer the questions provided.
7. Questions
8. What is the diagram about?**(01mark)**
9. What is the function of anhydrous copper II sulphate?**(01mark)**
10. What if heat energy would not be supplied in the combustion tube, do you think hydrogen could react? Give a reason.**(02marks)**
11. Give the chemical equation for the reaction of hydrogen gas and heated copper II oxide**(01mark)**
12. Questions
13. Explain why the gas named above, is used for food stuff production? Example prestige **(02marks)**
14. State how the gas is collected when prepared and give reason for your answer.**(02marks)**
15. A mass of 20.0g of petrol was burnt in air. The heat produced was used to heat 2.5 litres of water. Given that, the heat value of petrol is 43640KJKg-1. What was the temperature change of water?
16. (a) With the aid of electronic diagram show how water is formed from the chemical combination of hydrogen and oxygen gas.**(04marks)**

(b)Given that

1. NO2
2. CaCl2

State the four differences between the two compounds **(04marks)**

1. (a) Explain what is likely to happen to a student doing an experiment in the laboratory under the following conditions
2. Noisy and dirty laboratory room**(01mark)**
3. No gloves, goggles, or laboratory coat**(01mark)**
4. Unstopped bottles of chemicals**(01mark)**

(b)State the use of the following apparatuses

1. Deflagrating spoon**(01.5marks)**
2. Lie berg**(01.5marks)**
3. Crucible **(01.5marks)**
4. Glass rod**(01.5marks)**

**SECTION C (30 Marks)**

**Attempt only two (2) questions from this section**

1. (a) By the aid of balanced chemical equation, explain the main types of chemical reactions**(12marks)**

(b)Write balanced net ionic equation for the reaction of aqueous hydrochloric acid and sodium hydroxide**.(03 marks)**

1. With examples, explain the economic uses of water. Give six points **(15marks)**
2. What are the negative impacts brought by the use of charcoal as source of fuel? (Give six points)**(15marks)**