**PRESIDENT’S OFFICE**

**REGIONAL ADMINISTRATION AND LOCAL GOVERNMENT**

**LINDI REGIONAL COMMISSIONER’S OFFICE**

**FORM FOUR MOCK EXAMINATION**

**CHEMISTRY 1**

**CODE NO. 032/1 MAY, 2018**

**TIME: 3:00 HOURS**

**INSTRUCTIONS:**

1. This paper consists of section A, B and C.
2. Answer ALL questions in this paper
3. Cellular phone and calculators are not allowed in the examination room.
4. Write your examination number on every page of your answer booklet(s)
5. The following constant may be used.

Atomic masses

H = 1, O = 16, Na = 23, C = 12, Cl = 35

Avogadro’s number = 6.02 x $10^{23}$

G. M. V at s.t.p = $22.4dm^{3}$

1 Faraday = 96500 coulombs

$1dm^{3}=1000cm^{3}$

**SECTION A: 20 MARKS**

1. For each of the items (i) – (x), choose the correct answer from the given alternatives and write its letter beside the item number in the answer booklet provided.
2. A substance, which absorbs water from the atmosphere and form a solution is called?,
3. Efflorescent
4. Hydroscopic
5. Deliquescent
6. Amphoteric
7. One of the following can be used to remove colouring matter from brown sugar;
8. Wood charcoal
9. Animal charcoal
10. Lamp black
11. Bleaching agent
12. A solution was found to have a pH of 5. The solution is?
13. A strong base
14. A strong acid
15. A weak acid
16. Strong base
17. If A(g) + B(g) C(g) is an exothermic reaction, high yield of C(g) can be obtained by doing the following.
18. Increase the pressure of the system
19. Increase the concentration of C
20. Increase the temperature of the system
21. Decrease the pressure of the system
22. 0.5g of hydrogen gas is exploded in air to produce water. The mass of water formed is?
23. 1.8g
24. 4.5g
25. 0.75g
26. 18g
27. The oxidation number of phosphorus in the radical $PO\_{4}^{3-}$ is;
28. +3
29. +5
30. -3
31. -5
32. 2.0g of sodium hydroxide in 250cm3 solution has a concentration of?
33. 0.02 moles per dm3
34. 0.1 moles per dm3
35. 0.25 moles per dm3
36. 0.2 moles per dm3
37. In plant nutrients, nitrogen, phosphorus and potassium are classified as ……..… nutrients
38. Micro
39. Trace
40. Macro
41. Supplementary
42. An electric current of 0.2A was passed through an electrolyte for 15 minutes and 35 seconds. What is the quantity of electricity passed?
43. 187C
44. 10C
45. 18.7C
46. 935C
47. Which of the following organic compound do not belong to the homologous series of alkanes;
48. $CH\_{4}$
49. $C\_{2}H\_{4}$
50. $C\_{3}H\_{8}$
51. $C\_{4}H\_{10}$
52. Match the items in List A with the responses in List B by writing the letter of the correct response beside the item in List A.

|  |  |
| --- | --- |
| **LIST A** | **LIST B** |
| i | Electrolyte | A | Carry electric current in solid conductor |
| ii | Non electrolyte | B | Adds up to cation during electrolysis |
| iii | Weak electrolyte | C | Carry electric current in solution |
| iv | Electrolytic cell | D | Electrode through which electrons enter the external circuit |
| v | Electrode | E | Electrode through which electrons enter the electrolyte |
| vi | Ions | F | Do not conduct electric current when in solution |
| vii | Anode | G | Dissociate into free ions when in solution |
| viii | Electrochemical cell | H | Partially ionize in solution |
| ix | Cathode | I | Convert electrical energy to chemical energy |
| x | Chemical equivalent | J | Current enters and leaved the external circuit |
|  |  | K | Positively charged ions |
|  |  | L | Convert charged ions |
|  |  | M | Convert chemical energy to electrical energy |
|  |  | N | Amount of substance liberated by one Faraday |
|  |  | O | Amount of substance liberated by one coulomb |

***SECTION B: 54 MARKS***

1. Study the information in the table below and answer the questions that follows;

|  |  |
| --- | --- |
| Element  | Atomic number |
| V | 11 |
| W | 13 |
| X | 16 |
| Y | 18 |
| Z | 19 |

1. State the elements which belong to the same
2. Group
3. Period
4. (i) Identify the element which is in gaseous state at room temperature

(ii) State an element which does not form an oxide

(iii) Give the formula for the sulphate of element W

(iv) Give the equation for the reaction between X and Z.

1. a) (i) Define nitrogen fixation.

 (ii) Explain why the naturally occurring nitrogen gas is not available to plant directly?

1. (i) Give four (4) human activities which disturb the natural balance nitrogen

(ii) What are the advantages of leguminous plants and soil micro-organism in the soil?

1. a) (i) What is a reversible reaction.

 (ii) List down three (3) factors which affect the position of equilibrium in reversible reactions

1. The industrial preparation of ammonia in Harber process is represented by the following equation

catalyst

$N\_{2(g)}+3H\_{2(g)} NH\_{3(g)} ∆=-46.2KJ/mol$

V2O5

Study the equation carefully then answer the questions that follow. What will happen to the position of equilibrium if:-

1. The temperature of the system is increased?
2. More nitrogen gas is added to the equilibrium mixture?
3. The formed ammonia gas is removed from the equilibrium mixture?
4. (i) What is the use of catalyst in the reaction above?

(ii) What is the meaning of the negative sign against the value of heat change -46.2kj/mol in the chemical reaction given in (5b) above?

1. a) 3.5g of gaseous hydrocarbon Q consists of 3g of carbon.
2. What is the empirical formula of Q
3. If 560cm3 of Q at s.t.p. weigh 0.7g. Find its molecular formula

b. (i) State the homologous series to which Q belong

 (ii) Show how Q reacts with Chlorine

 (iii) Show how Q reacts with hydrogen chloride

1. a) Define:- (i) Molar solution

(ii) Standard solution

b. A solution contains 7g per dm3 of anhydrous sodium carbonate plus some impurities which do not react with hydrochloric acid. 20cm3 of the base solution is neutralized by 25.000cm3 of 0.1M hydrochloric acid.

1. Write down a balanced chemical equation for the reaction
2. Calculate the concentration of sodium carbonate in moles/cm3
3. Calculate the weight of sodium carbonate per dm3
4. Calculate the percentage impurities
5. Study carefully the figure below and then answer the questions that follow.

F

D

G

E

C

B

A

1. Name the device
2. What is the element obtained in the process?
3. Label part A, B, C, D, E, F and G
4. name the ore used in this process
5. Is the element in (b) a metal or non-metal?
6. A green substance AA on heating gave off BB which turned lime water milky and a black residue CC which dissolved in dilute sulphuric acid to form a blue solution DD. When a pen-knife blade was dipped into the blue solution DD a reddish-brown coating was deposited on the pen-knife blade
7. Identify substance AA, BB, CC and DD
8. Write a balanced chemical equation for each step outlined above
9. Study the diagram below;

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source

+

-

Cathode

Anode

Molten Sodium Chloride

Na

Cl

1. Name the electrode where
2. Oxidation occur
3. Reduction occur
4. Write down the half reaction equation, occurring at;
5. Anode
6. Cathode
7. If a steady current of 100A flows for 20 minutes through a molten sodium chloride (refer the diagram above) calculate;
8. The mass of sodium metal deposited
9. The volume of chlorine gas liberated at S.T.P
10. The diagram shows a set up used to demonstrate the reaction between chlorine and hydrogen sulphide gas.

H2S(g)

Chlorine water

1. What is chlorine water?
2. What is observed when hydrogen sulphide gas is bubbled through chlorine water?
3. Write an equation for the reaction between chlorine and hydrogen sulphide
4. Which substance is an oxidizing agent and the redusing agent in the above reaction?

**SECTION C: 26 MARKS**

**Answer all questions in this section**

1. a) (i) Define the term pollution

 (ii) What are the main types of pollution?

b) (i) What does term terrestrial pollution mean?

 (ii) Mention three (3) causes of terrestrial pollution

 (iii) Explain two (2) methods of preventing terrestrial pollution

 c) What is the effect of ultraviolet radiations on living organism?

 d) (i) What is the function of ozone layer?

 (ii) What control measures should be taken to prevent destruction of ozone layer?

1. a) Give the scientific name of the following;
2. $CH\_{3}CH=CH\_{2}$
3. $C\_{2}H\_{4}Br\_{2}$
4. $CH\_{3}COOC\_{2}H\_{5}$
5. $CCl\_{4}$

$b) $ Write the open structure of the following compounds

1. Pent-1-ene
2. Hex-3-ene
3. 2,3-dimethylbutan-1-ol
4. 3-methylbut-1-yne

$$c) In tabular form list down five \left(5\right)chemical distinctions between ethane and ethene$$