**LINDI MUNICIPAL COUNCIL**

**WEEKLY EXAMINATION FORM FOUR JULY 2018**

 **TIME: 2.00 HOURS 032/1 CHEMISTRY**

**Instructions**

1. This paper consists of sections **A, B** and **C.**

2. Answer **all** questions in this paper.

3. Calculators and cellular phones are **not** allowed in the examination room.

4. Write your **Examination Number** on every page of your answer booklet(s).

5. The following constants may be used.

**Atomic masses:**

H = 1, C = 12, O = 16, N = 14, Na = 23, Mg = 24, Al = 26, ***K = 39,***

S = 32, Cl = 35.5, Ca = 40, Mn = 55, Fe = 56, Cu = 64.

Avogadro’s number = 6.02 x 1023.

GMV at s.t.p. = 22.4 dm3.

1 Faraday = 96,500 coulombs.

Standard pressure = 760 mm Hg.

Standard temperature = 273 K.

1 litre = 1 dm3 = 1000 cm3.

**SECTION A (20 Marks)**

Answer **all** questions in this section.

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.

(i) A catalyst can be described as a substance

 A. that alters the rate of reaction B. that slows down the rate of reaction C. used in every reaction so as to speed up rate of reaction D. that starts and speeds up the rate of reaction E. that terminates chemical reaction.

(ii) A covalent bond is formed when

 A. a metal combines with a nonmetal B. potassium and oxygen combine

 C. ammonia is formed D. two metals combine E. atom looses an electron.

(iii) How many moles of oxygen are required for the complete combustion of 2.2 g of C 3 H 8 to

 form carbon dioxide and water?

 A 0.050 moles B 0.15 moles C 0.25 moles D 0.50 moles E 0.025 moles.

(iv) Fractional distillation process of a mixture of water and ethanol is possible because

 A. water and ethanol have the same boiling point B. water has lower boiling point than ethanol

 C. ethanol has lower boiling point than water D. water and ethanol form partially immiscible liquid solution E. water and ethanol are immiscible liquids.

(v) Which of the following substances represent a group of acidic oxides?

 A. Carbon dioxide, carbon monoxide and sulphur dioxide

 B. Sulphur trioxide, nitrogen dioxide and nnitrogen monoxide

 C. Carbon dioxide, sulphur dioxide and dinitrogen oxide

 D. Sulphur trioxide, carbon dioxide and nitrogen dioxide

 E. Carbon monoxide, nitrogen oxide and sulphur dioxide.

(vi) What will the molarity of a solution which contains 26.5 g of anhydrous sodium carbonate in 5 dm3 of solution? A. 0.05 M B 0.25 M C 5.30 M D. 0.025 M E 0.50 M

 (vii) The Brownian movement is taken to be the evidence of the:

 A. theory of association of water molecules B. theory of ionization of electrolytes

 C. theory of colloidal suspensions D. kinetic theory of behavior of substances E. Brownian theory.

(viii) One off the isotopes of an element X has an atomic number Z and a mass number A. What is the number of neutrons contained in the nucleus of the element X?

 A. Z B. A C. A + Z D. A – Z E. Z – A

(ix) C2H4Cl can be represented in different structures which are called

 A. homologous series B. isomers C. structural formulae D. identical structures E. condensed structures.

(x) \_\_\_\_\_\_\_\_\_\_\_\_\_ is the general term used to explain a mixture of different metals.

 A. Alloy B. Allotrope C. Amphoteric D. Amorphous E. Isotope.

2. Match the items in **LIST A** with the responses in **LIST B** by writing the letter of the correct

response beside the item number.

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|  |  |
| --- | --- |
| **LIST A** | **LIST B** |
| (i) Oxygen | A. Greenyellow gas which rapidly bleaches damp litmus paper |
| (ii) Sulphur dioxide | B. Heats with cracking sound |
| (iii) Ammonia | C. It rekindles a glowing splint of wood |
| (iv) Hydrogen Chloride | D. Colourless gas, extremely poisonous since it combines with hemoglobin in red blood cells. |
| (v) Carbon monoxide | E. Brownring test |
| (vi) Nitrogen | F. Produces a white precipitates of silver chloride in a drop of a solution of silver nitrate |
| (vii) Hydrogen | G. It is the only alkaline gas |
| (viii) Chlorine | H. Substitution reaction |
| (ix) Nitrogen dioxide | I. Explodes with air when flame applied |
| (x) Carbon dioxide | J. Sweet aroma smell |
|  | K. It is a brown gas |
|  | L. It is very irritating smell and decolorizes potassium manganate (VII) solution with no precipitation left M It turns lime water milky |
|  | N. Colourless,odourless, nonpoisonous gas commonly used as arefrigerant |
|  | O. Characteristic yellow flame |
|  | P. Good solvent for fats and grease, nonpoisonous |
|  | Q. Blackens lead (II) ethanoate paper |
|  | R. Turns brown on exposure to air |
|  | S. Freezes at 0°C and boils at 100°C |
|  | T. Rottenegg |

**SECTION B (54 Marks)**

Answer **all** questions in section.

3. (a) Njema’s child was sick. When she took her to the hospital, she was prescribed some medicine including a bottle of syrup. The bottle was written, Shake before you use. What does this statement signify?

(b) (i) What is the first step to take when you want to identify the contents of a given salt containing one anion and one cation?

(ii) In a solution of water, identify a solute and a solvent. Justify your answer.

(c) Sodium is a solid while chlorine is a gas at room temperature although they are in the same period in the periodic table. What is the cause of this difference?

4. Study the following part of the periodic table and then answer the questions that follow.

 **Note:** The letters used are not scientific symbols for the elements concerned.

 **Group**

 I 0

|  |  |  |
| --- | --- | --- |
|  | II III IV V VI VII |  |
|  |  |  |  |  |  | N |  |
|  | K |  |  |  | Q |  | P |
| L |  |  |  |  |  |  |  |

(a) Identify and write down the electronic configuration for the elements K, N, P and L.

(b) What type of bond will exist in a compound formed when Q combines with L? Write the

chemical formula for the compound formed and list two chemical properties for the compound formed.

5. (a) A solution of sodium hydroxide was electrolysed using platinum electrodes. Write the reactions which took place at the electrodes and give a reason why the solution becomes alkaline.

(b) Electric current was passed through a solution of sodium hydroxide using platinum electrodes. Draw a labelled electrolytic cell for this electrolysis. Indicate the directions of the movement of ions.

6. (a) Give the name of the process of making coke from coal. Write one characteristic which make coke a better fuel than coal.

(b) (i) State the difference between physical strength and chemical strength of metals.

(ii) Giving example, explain why preparation of metallic oxides by direct method is not intensively used.

7. (i) People suffering from heart burn usually use wood ashes for relief. Mention characteristic which makes the ashes to be used for heart burn relief.

 (ii) Give four compounds found in laboratories which show the same characteristics as ashes.

 iii) Write all the structural isomers of alcohols whose molecular formula is C4H9OH

 iv) briefly explain why carbon dioxide is very important for marking life on Land and Sea possible

8. (a) (i) Name the products formed when nitrates of potassium and zinc decompose by heat.

 (ii) Suggest why the nitrates of zinc and potassium behave differently on heating.

 (b) Mention two uses of sodium nitrate.

*9*. (a) (i) What type of a chemical bond is found between fluorine atoms in a fluorine molecule?

 (ii) Name other type(s) of chemical bond formed by fluorine with other elements.

 Give an example of a compound in which fluorine form this type of bond.

 (b) Compound X contains 24.24% carbon, 4.04% hydrogen and 71.72% chlorine. Given that, the vapour density of X is 49.5.

 (i) Calculate the molecular formula of the compound X.

 (ii) Draw and name the displayed/open structure formula of the possible isomer(s) from the molecular formula determined.

10. (a) (i) Name three gases which should not be produced in order to prevent the destruction of ozone layer.

 (ii) List and explain three effects of ozone layer depletion.

 (b) Lack of safe water for domestic and industrial uses is a serious problem in most of Tanzanian towns. The major cause of this problem is pollution in the water sources. Slate three methods that could make water from a pond or a well be safe for drinking.

11. a) Briefly describe how sodium is extracted in Down’s cell. Write all the necessary equation

 b) List at least four uses of sulphur.

 **SECTION C (26 Marks)**

 Answer **all** questions in this section.

12. Addition of inorganic fertilizers in the farm is not as important as addition of organic manure.

 Discuss the correctness of this statement in four points.

13. Environment supports lives of all organisms. Its pollution has led to some major catastrophic effects. Describe water pollution by analyising its causes, effects and proactive and remedial measures to be taken.