

The United Republic Of Tanzania

President's Office

REGIONAL ADMINISTRATION AND LOCAL GOVERNMENT

RUVUMA REGION

SONGEA MUNICIPAL COUNCIL

FORM THREE MIDTERM EXAMINATION MARCH 2024

032

CHEMISTRY

TIME: 3 Hours

March, 2024

INSTRUCTIONS

1. This paper consists of section **A**, **B** and **C** with a total of eleven 11 questions
2. Answer all questions in sections **A** and **B** and **two (2)** questions from section **C**
Remember to write your name in every page

SECTION A
Answer all questions

1. For each item (i-x) choose the correct answer from the given alternatives and write the letter besides the item number in the answer sheet provided

i) The net charge of the nucleus of an atom is

- A. Negative charge
- B. Neutral
- C. Positive charge
- D. Zero
- E. None of the above

ii) Chausiku was testing a certain solution in the laboratory, suddenly the solution turned to pink when she added a P.O.P indicator. The solution is likely to be

- A. Caustic soda
- B. Potassium hydroxide
- C. Citrus fruit juice
- D. Distilled water

iii) Which of the following set contains the same number of electrons

- A. Cl, He, Ne, O₂
- B. Na⁺, Mg²⁺, Be²⁺
- C. O₂, F⁻, Ne, Na
- D. Cl, Mg²⁺, Al, Na⁺
- E. K⁺, Ca²⁺, Cl⁻, Ar

iv) A house girl was cooking by using a gas stove. Suddenly she noticed a gas leak from the gas tank which then causes fire accident in the kitchen.

- A. Class E
- B. Class C
- C. Class D
- D. Class A
- E. Class B

v) The solid compound Q was put on a watch glass and left open over the night. During the morning the solution was found to have water but not form a solution. This compound is said to be

- A. Efflorescent
- B. Soluble
- C. Deliquescent
- D. Hygroscopic

E. Insoluble

vi). Mr Jacob was demonstrating a certain method of separating mixture in the laboratory. He took 250 cm³ of ethanol and mixed with 350 cm³ of water. He then performed a separation technique until he completely separated ethanol from water. Which separation technique did he perform?

- A. Paper chromatography
- B. Simple distillation
- C. Filtration
- D. Fractional distillation
- E. Evaporation

vii). Yesterday TANESCO's power went off so at our home we used candle for lighting. What are the characteristics of the flame produced by the candle?

- A. It is bright and non-sooty
- B. It is very hot and large
- C. It has three zones
- D. It is very hot and large
- E. It is bright and less hot

viii). In the formula A₂B₃. What is the valence of "A" and "B"?

- A. -3 and +2
- B. 2 and 3
- C. 2 and 3
- D. +2 and -3
- E. 4 and 6

ix). Potable water is the one which is

- A. Good for transportation
- B. Less contaminated
- C. Kept in the pots for different use
- D. Clean and safe for drinking
- E. Equal to pH of 7

x). Which of the following apparatus is used for drying solids in the laboratory?

- A. Desiccator
- B. Test tube
- C. Crucible and lid
- D. Mortar and pestle
- E. Pipe clay triangle

2. Match the items in list A with the corresponding items in list B

LIST A	LIST B
(i) When exposed to you for a longtime, your organs will be damaged (ii) Involves sharing of electrons (iii) It produces soot (iv) Common salt (v) Reaction between acid and alkali (vi) It lightens up the splint	A. Luminous flame B. Dilute acid C. Oxidant D. Radioactive materials E. Im tanto F. Covalent bond G. Electrovalent bond H. Non-luminous flame I. CaCO_3 J. Nacl K. Metal hydroxide L. Hydrogen gas M. Oxygen gas.

SECTION B (54 MARKS)

(Answer ALL questions in this section)

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3. (a) The gas X which re-light a glowing splint is prepared in the laboratory by heating together a white solid Y and the black powder Z and the gas is collected by downward displacement of water.
- What is the name of gas X
 - Briefly explain the chemical test of gas X
 - Name the white solid Y
 - What is the term given to the black powder Z?
 - State the role of the black powder Z
- (b) List down any four uses of gas X in our daily life
4. (i). By means of diagram illustrate the arrangement of electrons in Q both before and after the reaction
- (ii). What type of bond found in compound R
- (iii). Give the IUPAC name of the white solid chloride R.
5. Form three students at Mtakuja secondary school tested four samples of water from different areas at Mvomero district by shaking 40cm^3 of each sample with three

drops of soap solution. They repeated their experiment for the second time by boiling each sample of water with three drops of soap solution. They then recorded their observations as shown below

Sample of water	Observations with soap solution before boiling	Observations with soap after boiling
A	No lather	Lather
B	Lather	Lather
C	Lather	Lather
D	No Lather	No lather

- (i) Which sample contains only temporary hardness of water? Explain your answer
- (ii) Which sample contain permanent hardness of water, give a reason
- (iii) Name the chemical substance that could be the cause of hardness of sample A
- (iv) Write a balanced chemical equation for removing hardness of water in
 - (a) Sample A by boiling
 - (b) Sample D by chemical means

6.(a) From three students learn, hard water wastes soap. Give reasons for the following

- (i) How could this hardness of water have removed
- (ii) Which sample of water permanently hard
- (iii) State one advantage of drinking hard water

(b). Differentiate between the following

- (i) Acid and Base
- (ii) Spectator ion and Ionic equation.

7.(a) We encounter many many processes in our daily life that are good example of chemical changes. Give (3) three examples of these changes.

(b) List down three properties that are clearly whether muddy water is a mixture or a compound.

8. The sample of water tasted by shaking with soap solution

- (i) Describe how softening the hard water could save money
- (ii) What would be the effect of using temporarily hard water in a kettle.

SECTION C

Choose two (2) questions from this section

9. The following are steps to follow in lighting of the Bunsen burner. However the steps are not in the correct order. Re-write them in the correct sequence.

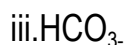
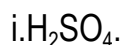
- (i) Close the air holes
- (ii) Adjust the gas tap until gas supply is enough to produce a non-luminous flame
- (iii) Immediately bring a flame at the top of the barrel or chimney
- (iv) Connect the Bunsen burner to the rubber tube which is fixed to the gas tap.
- (v) Allow plenty of gas to enter the burner by turning it on.
- (vi) Then adjust the air holes until you get the type of flame you want.

10. Form three students were taken to the chemistry laboratory for demonstration of reaction between Acid and Base substance. They found in a bench two reagents

- (i) Write a chemical equation for this reaction, choose any base and acid known
- (ii) Give the name of the major product formed
- (iii) Which name is assigned to these types of reaction?

11. (a) What are the two main difference which exist between valence and oxidation number?

(b) Calculate the oxidation number of hydrogen in



(c) Calculate the empirical formula of a compound having the following

composition. 16.1% sodium, 4.2% carbon, 16.8% oxygen and the rest percentage being water of crystallization.

- (i) Find the % composition of water of crystallization
- (ii) Calculate the empirical formula of the compound?