

CHEMISTRY (Theory)

Date: 21/June/2024

Period: 08:30 AM – 11:30 AM



END OF TERM III EXAMINATION, 2023-2024

QUESTION PAPER

LEVEL : ORDINARY

GRADE : SENIOR ONE (S1)

DURATION : 3 HOURS

MARKS : /100 **CAMIS (Theory + Practical)** /40

INSTRUCTIONS:

- 1) Write your full identification on the answer sheet.
- 2) This paper consists of **TWO** sections: **A** and **B**.
 - **Section A:** Attempt **ALL** questions. **(70 marks)**
 - **Section B:** Attempt any **THREE** questions. **(30 marks)**
- 3) **You do not need the periodic table.**
- 4) The marks to be recorded into **CAMIS** will result from the sum of theory and practical exam marks, that will be converted to **40 marks**.
- 5) Use only a **blue** or **black** pen for answering and a **pencil** for drawing.

SECTION A: ATTEMPT ALL QUESTIONS**(70 marks)**

1) Choose a correct meaning for each of the following safety symbols as used in laboratory.



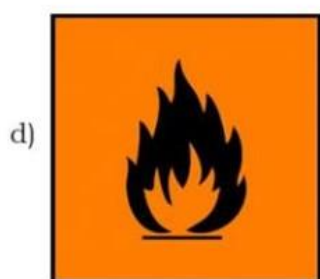
- i) Highly inflammable
- ii) Toxic
- iii) Corrosive
- iv) Radioactive

(1 mark)

- i) Corrosive
- ii) Irritant
- iii) Radioactive
- iv) Explosive

(1 mark)

- i) Harmful
- ii) Corrosive
- iii) Electric shock
- iv) Laser radiations

(1 mark)

- i) Irritant
- ii) Laser radiation
- iii) Highly flammable
- iv) Explosive

(1 mark)

2) Match each type of mixture on the left with its most suitable method for separation on the right.

(4 marks)

SN	Type of mixture		SN	Method of separation
a)	Ethanol and water		i)	Decantation
b)	Oil and water		ii)	Filtration
c)	Flour and iron nails		iii)	Fractional distillation
d)	Sand and water		iv)	Magnetic separation

3) Fill in the blank spaces correctly by use of provided terms: *protons, sub-atomic, neutrons, atom*. **(4 marks)**

- An _____ is the smallest particle of an element.
- There are three _____ particles in the atom.
- The number of _____ and electrons in a neutral atom is the same.
- Protons and _____ are found inside the nucleus.

4) There are different types of wastes. Match each waste material on the left with its corresponding type. **(4 marks)**

SN	Waste material		SN	Type of waste
a)	Plastic bottles		i)	Biodegradable solid waste
b)	Sewage from hospital		ii)	Non-biodegradable solid waste
c)	Paper wastes		iii)	Liquid
d)	Ammonia gas		iv)	Gas

5) Choose a correct answer for each of the following questions.

- a) Potassium chloride, KNO_3 is a(n): **(1 mark)**
- acidic salt.
 - double salt.
 - normal salt.
 - basic salt.

- b) Which among the following is an acidic salt? **(1 mark)**
- KNO_3
 - K_2SO_4
 - $NaCl$
 - $NaHCO_3$

- c) The correct IUPAC name for NH_4Cl is: **(1 mark)**
- tetrahydrogenonitrogenchloride.
 - ammonium chloride.
 - ammoniafour chloride.
 - nitrogenhydrogen chloride.

- d) Which among the following is a soluble salt? **(1 mark)**
- $NaNO_3$
 - $PbSO_4$
 - $AgCl$
 - $CaCO_3$

6) The knowledge and skills gained in Chemistry help to develop the economy of the country through different fields. Fill in the blank spaces below with the provided fields of application of Chemistry.

- Manufacture of medicines and vaccines
- Environment conservation

iii) Manufacture of fertilizers

iv) Water treatment

- a) _____ helps to boost agricultural production in terms of quantity and quality of the products and build strong economies through internal and external trades. **(1 mark)**
- b) _____ help people to avoid activities such as deforestation and overstocking, which can cause environmental degradation. **(1 mark)**
- c) _____ helps to reduce the rate of disease outbreaks. The reduction of disease outbreaks helps the government to save a large share of its revenue to other development activities. **(1 mark)**
- d) _____ reduce infant mortality and hence increasing the size of healthy population ready to work in farms and industries. **(1 mark)**

7) Laboratory apparatuses are of different types in terms of materials from which they are made, their names and uses.

- a) List any three (3) flasks used in laboratory. **(3 marks)**
- b) Suggest the name of the appropriate apparatus used for supporting beakers while heating liquids. **(1 mark)**
- c) Explain why most laboratory apparatuses are made in glass? **(2 marks)**

8) The following diagram (*Figure 1*) is not completely labelled and has no title.

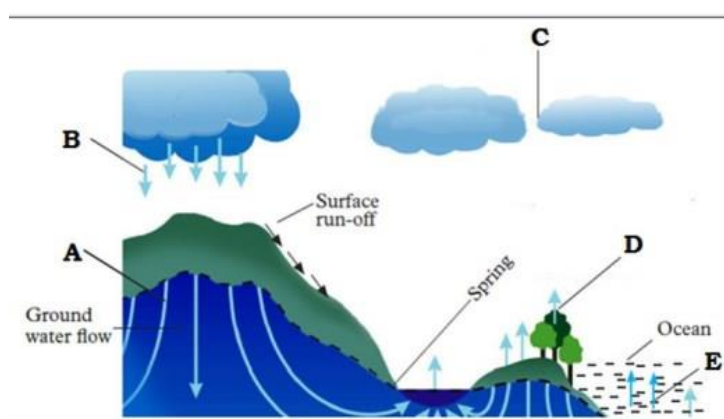


Figure 1

- a) What does the diagram in *Figure 1* stand for? **(1 mark)**
- b) State the names for each of the stages:
- i) A **(1mark)**

- ii) B **(1 mark)**
- iii) C **(1 mark)**
- c) Give the similarity and difference between stages **D** and **E**. **(2 marks)**
- 9) Chemical reactions and chemical equations relate and differ one another.
- a) State the *Lavoisier's law* of conservation of matter. **(1 mark)**
- b) Give any three (3) observations that accompany chemical reactions. **(3 marks)**
- c) Differentiate a chemical equation from a chemical reaction. **(2 marks)**
- 10) Three atoms of elements are represented as follows: ${}^{19}_9\text{X}$, ${}^{20}_{10}\text{Y}$ and ${}^{26}_{12}\text{Z}$.
- a) Write the electronic configuration for **X**, **Y** and **Z** atoms. **(3 marks)**
- b) Which of the atoms **X**, **Y** and **Z**:
- i) reacts by losing electrons? **(1 mark)**
- ii) reacts by gaining electrons? **(1 mark)**
- c) Predict the chemical formula of compound formed between **X** and **Z**. **(2 marks)**
- 11) A student passed 140cm^3 of air over heated copper metal until there was no further change. Given that the remaining volume of air was 111cm^3 .
- a) Name the main gases remaining in the volume of 111cm^3 of air. **(3 marks)**
- b) Explain why the volume of air decreases from 140cm^3 to 111cm^3 . **(2 marks)**
- c) Calculate the percentage by volume of the gas used while passing air over copper metal. **(2 marks)**
- 12) This question concerns chemical formulae and equations.
- a) Write correctly the compound formed between the provided ions:
 Na^+ and PO_4^{3-} **(1 mark)**
- b) Convert the following word equations into balanced symbolic chemical equations.
- i) Hydrogen + Chlorine \longrightarrow Hydrogen chloride **(2 marks)**
- ii) Sulphur + Oxygen \longrightarrow Sulphur dioxide **(2 marks)**
- iii) Sodium hydroxide + Nitric acid \longrightarrow Sodium nitrate + Water **(2 marks)**

13) Acids, bases and salts constitute the important functions of inorganic compounds.

a) Give the definition of *salt*. **(1 mark)**

b) Give the chemical formula and IUPAC name of the salt formed when ammonium ions replace all the hydrogen ions of sulphuric acid. **(2 marks)**

c) Predict the products formed when the following salts are heated:

i) $\text{NaNO}_3(\text{s}) \xrightarrow{\text{heat}}$ **(2 marks)**

ii) $\text{CaCO}_3(\text{s}) \xrightarrow{\text{heat}}$ **(2 marks)**

SECTION B: ATTEMPT ANY THREE (3) QUESTIONS

(30 marks)

14) The graph below (*Figure 2*) shows the substance (ice) heated until boiling.

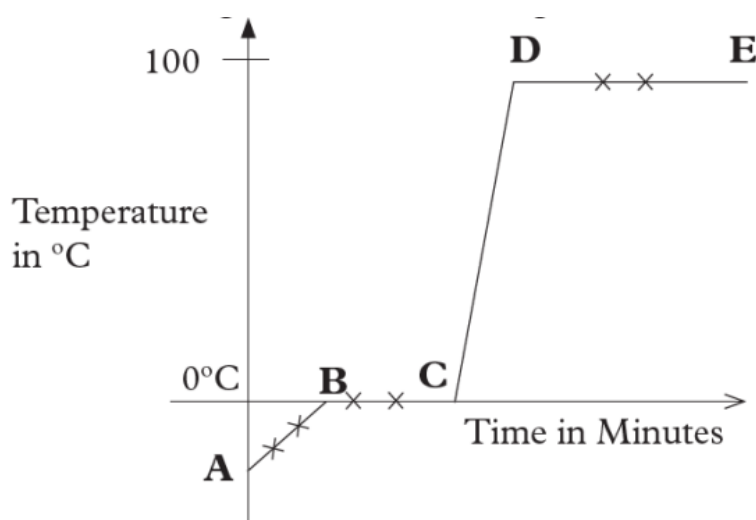


Figure 2

a) Name the physical state of substance in region between:

i) A and B **(1 mark)**

ii) C and D **(1 mark)**

b) State and explain the physical change occurring in region between:

i) B and C **(2 marks)**

ii) D and E **(2 marks)**

c) Differentiate between physical change and chemical change with one supporting example for each. **(4 marks)**

15) The following grid (Figure 3) shows a section of the Periodic Table *with no true symbols*. Study it and answer the questions that follow.

1												18					
1	2											13	14	15	16	17	² M
3 B	4	(3-12)										5	6	7	8	9	10 N
11 D	12											13 E	14	15	16 J	17	18
19 G	20 Q																

Figure 3

- Give the specific names for group 1 and group 17 elements. **(2 marks)**
- State the specific name given to horizontal rows of the Periodic Table. **(1 mark)**
- Identify any two (2) elements which are metals. **(2 marks)**
- State any one (1) element which is:
 - a noble gas? **(1 mark)**
 - an alkaline earth metal? **(1 mark)**
- Fill in the blank spaces. **(2 marks)**

Elements in the today Periodic Table are arranged in order of

- _____ whereas in Mendeleev table, they were arranged in order
 - of their _____.
- Given some groups of three elements below each with its atomic mass. Which of them is a *triad* of Dobereiner? **(1 mark)**
 - X = 12, Y = 15 and Z = 32
 - U = 32, V = 79.5 and W = 127
 - K = 24, L = 22 and M = 36
 - P = 4, Q = 8 and R = 9

16) Mixtures may be homogeneous or heterogeneous.

- What is a mixture? **(1 mark)**
- Differentiate between homogeneous mixture and heterogeneous mixture. **(2 marks)**
- Use the term "*miscible*" and "*immiscible*" to fill in the blank spaces of the passage below.
 - Two liquids that do not mix to form homogeneous mixture are known as _____ liquids. **(1 mark)**
 - Liquids which mix to form homogeneous mixture are _____. **(1 mark)**

d) A mixture of metals (alloy) is composed of 1.8 grams and 1.2 grams of tin (Sn) and lead (Pb), respectively. Calculate the percentage composition of each metal in the mixture. **(3 marks)**

e) Given the following mixtures:

- i) Water and sugar.
- ii) Water and petrol.
- iii) Water and ethanol.
- iv) Water and salt.

i) Which one is a heterogenous mixture? **(1 mark)**

ii) Justify your answer. **(1 mark)**

17) The set up below (*Figure 4*) is used to prepare oxygen gas in laboratory.

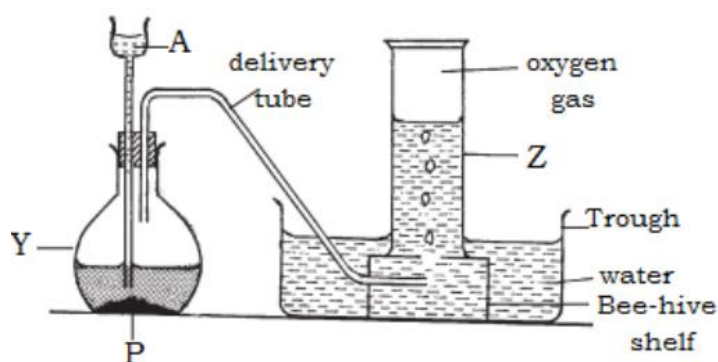


Figure 4

a) Name the substances which are used as liquid **A** and solid **P**. **(2 marks)**

b) Name the apparatuses **Y** and **Z**. **(2 marks)**

c) Describe how you would confirm the presence of oxygen. **(1 mark)**

d) State any two (2) uses of oxygen. **(2 marks)**

e) State one physical property of oxygen related to its method of collection. **(1 mark)**

f) A student decides to use the above method to collect sulphur dioxide (SO₂).

Is this decision appropriate? Justify your answer. **(2 marks)**

18) The table below contains some solutions and their pH values. Study it and answer the questions that follow.

Solution	pH value
A	3.0
B	12.5
C	7.0

- a) Which solution is:
- i) basic? **(1 mark)**
 - ii) acidic? **(1 mark)**
 - iii) neutral? **(1 mark)**
- b) Use the red or blue litmus paper to predict the colour change of the litmus papers in the solution **A, B** and **C**. **(3 marks)**
- c) Suggest one application of:
- i) acids **(1 mark)**
 - ii) bases **(1 mark)**
- d) After covering the Chemistry of Senior One you meet in your local area the following problems, caused by acids and bases. Propose an advice that you could provide for each problem below.
- i) *Tooth decay* due to bacteria that change foods into acids. **(1 mark)**
 - ii) *Soil acidity* which is unsuitable for growth of certain crops. **(1 mark)**

END

**ALTERNATIVE TO
CHEMISTRY PRACTICAL**

Date: 20/June/2024

Period: 08:30 AM – 10:00 AM



END OF TERM III EXAMINATION, 2023-2024

QUESTION PAPER

LEVEL : ORDINARY

GRADE : SENIOR ONE (S1)

DURATION : 1 HOUR 30 MINUTES

MARKS : /20

INSTRUCTIONS:

- 1) Write your identification in the reserved space here below.
- 2) All answers should be written in the spaces provided in the question paper.
- 3) This paper consists of **ONE compulsory** question.
- 4) **You do not need the periodic table.**
- 5) Use only a **blue** or **black** pen for answering.

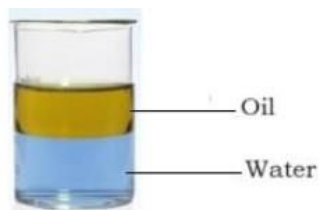
School _____

Student's names _____

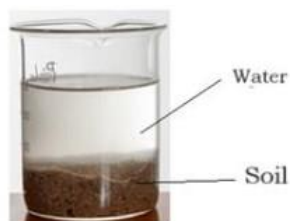
Class _____

1) You are provided with the following:

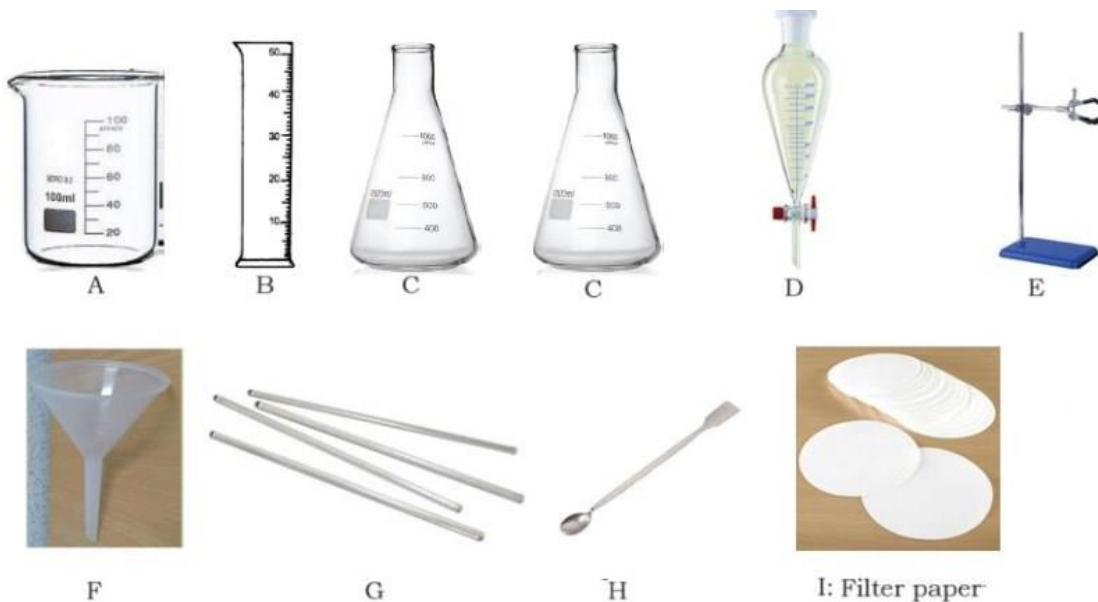
- Two (2) mixtures: **-WO** (Water and oil), which was obtained by pouring 150mL of oil in a beaker containing 250mL of water.



- **-WS** (Water and soil), which was obtained after adding 20g of soil in a beaker containing 300mL of water.



- Laboratory apparatus:



Observe and answer the related questions.

2) Questions:

a) What type of mixture is **WO**? **(1 mark)**

b) Name the apparatus indicated by the letters **A, B** and **G**. **(3 marks)**

A:

B:

G:

c) From the list above, give the names of the apparatus that will help to carry out the separation of the mixture **WO**. **(5 marks)**

d) From the list above, give the names of the apparatus that will help to carry out the separation of the mixture **WS**. **(4 marks)**

e) Name the technique used to separate the mixture **WO**. **(1 mark)**

f) Name the technique used to separate the mixture **WS**. **(1 mark)**

g) Suggest any two (2) precautions that must be taken when handling the above experiments. **(2 marks)**

- h) The three components: **water**, **soil** and **oil** are all put in the same beaker. Draw the beaker and show how the three components will behave in the same mixture. **(3 marks)**

END

**ALTERNATIVE TO
CHEMISTRY PRACTICAL**

Date: 20/June/2024

Period: 08:30 AM – 10:00 AM



END OF TERM III EXAMINATION, 2023-2024

MARKING GUIDE

LEVEL	: ORDINARY
GRADE	: SENIOR ONE (S1)
DURATION	: 1 HOUR 30 MINUTES
MARKS	: <input type="text" value=""/> /20

INSTRUCTIONS:

- 1) All answers should be written in the spaces provided in the question paper.
- 2) This paper consists of **ONE compulsory** question.

Answers:

a) **WO:** Heterogenous mixture/ Immiscible mixture? **(1 mark)**

b) Names of apparatus:

A: Beaker **(1 mark)**

B: Measuring cylinder **(1 mark)**

G: Glass stirring rod **(1 mark)**

c) Apparatus for separating the mixture **WO:**

A: Beaker **(1 mark)**

E: Retort stand and clamp **(1 mark)**

D: Separating funnel **(1 mark)**

C: Conical flask **(1 mark)**

F: Funnel **(1 mark)**

d) Apparatus for separating the mixture **WS:**

A: Beaker **(1 mark)**

C: Conical flask **(1 mark)**

F: Funnel **(1 mark)**

I: Filter paper **(1 mark)**

e) Decantation **(1 mark)**

f) Filtration **(1 mark)**

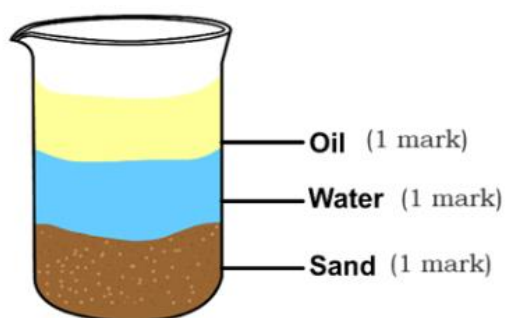
g) –Be carefully when manipulating the experiment because most of them are glasses and can break easily. **(1 mark)**

-Wear lab coat so that if the chemicals spill up, one is protected. **(1 mark)**

- Wear gloves to protect against any injury. **(1 mark)**

(Accept any other correct precaution)

h) Three components: **water, sand** and **oil:**



The densest component goes at the bottom.

-END-