

INTERSECONDARY SCHOOLS EXAMINATION SERIES

ISESE

FORM FOUR PRE-NECTA No.01

CHEMISTRY 1

TIME 3 HOURS

Thursday 18th July 2024

INSTRUCTIONS

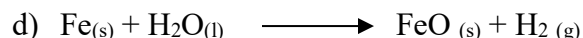
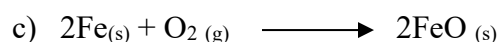
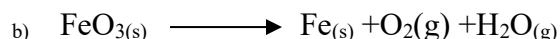
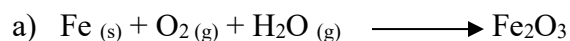
1. This paper consists of section **A**, **B** and **C** with total number of **eleven (11)** questions.
2. Answer all questions in the space provided
3. All writing must be in **black** or **blue** pen except for diagrams which must be in **pencil**.
4. Write your **examination number** at the top right corner of every page
5. The following atomic masses may be used; H = 1, O = 16, Na = 23, C = 12, Al = 27, Cu = 63.5

SECTION A (16 Marks)

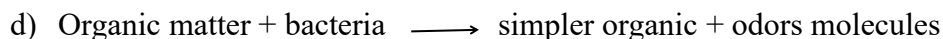
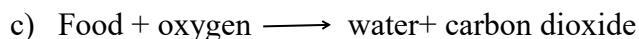
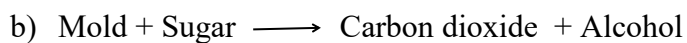
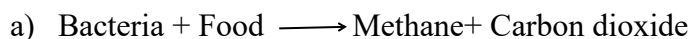
Answer **all** questions in this section

1. Choose the correct answer from the given alternatives and write the letter beside the item number.

i) Iron Railings on a balcony are slowly rusting due to exposure to oxygen and moisture in the air. What equations represent the formation of rust?



ii) Bacteria can spoil food by breaking down organic matter. During this process, they release, unpleasant odors. Which of the following equations represents this spoilage?



iii) Hard water cause problems in your plumbing over time. Which of the following is least likely to be problem caused by hard water build up?

a) Clogged pipes due to mineral deposits

b) Reduced water pressure in your faucets

c) Corrosion of pipes and appliances

d) Difficulty getting soap to lather

iv) You accidentally spill some vinegar (a weak acid) on your marble countertop what is the most likely observation you will make?

a) The vinegar will fizz and bubble rapidly

b) The colour of the countertop will fade slightly

c) The vinegar will evaporate quickly without any reaction

d) The countertop will be sickly and oily

- v) You are filling balloons with helium gas for a party. The helium tank contains 44.8 litre of helium gas at STP. How many moles of helium gas are in the tank?
- a) 0.5 moles
 - b) 1.0 moles
 - c) 10.0 moles
 - d) 20.0 moles
- vi) Electroplating is a technique used to coat an object with a thin layer of metal during gold electroplating; gold ions (Au^+) are attracted to the cathode and deposited as golden layer. What property of the gold ions allows them to be preferentially discharged at the cathode during electrolysis?
- a) Their positive charge
 - b) Their large size compared to other ions in the solution
 - c) Their high concentrations in the solution
 - d) Their greater attraction to electrons compared to ions in the solutions.
- vii) Why do we store fruits and vegetables in the refrigerator?
- a) It improves their state
 - b) The cold temperature kills bacteria (time but not in the context of the reaction rate)
 - c) Cold temperature slows down the chemical reactions that cause spoilage
 - d) It prevents them from dying out.
- viii) Your Smartphone contains tiny electrical components made from various metals. Which of the following metals is least likely to be extracted by electrolysis?
- a) Aluminium (Al)
 - b) Gold (Au)
 - c) Silver (Ag)
 - d) Iron (Fe)
- ix) Fire fighters use water to extinguish fires. Why is water so effective in putting out fires involving metal oxides?
- a) Water reacts with metal oxides to produce flame retardant gas
 - b) Water vapour displaces oxygen, preventing combustion
 - c) Water cools the burning materials below their ignition temperature
 - d) Water dissolves metal oxides, removing them from the fuel source

x) What is the role of a Bunsen burner in a flame test experiment?

- a) To create a pleasant aroma in the lab
- b) To identify metal ions by their characters flame colour
- c) To generate electricity for the experiment
- d) To cool down the metal ions

2. Match the items in list A with the correct repos in List B by writing the letter of the correct response beside the item number list A

LIST A	LIST B
(i) The speed at which a reaction occurs	a) Activation energy (Ea)
(ii) Forward and reverse reactions occur at equal rates	b) Catalyst
(iii) Minimum energy required for the reaction to occur	c) Chemical equilibrium
(iv) Energy absorbed for released during a chemical reaction	d) Collision theory
(v) Factor that can influence the rate of a reaction such as temperature, concentration presence of catalyst	e) Endothermic reaction
(vi) Favoured by rise of temperature	f) Enthalpy change
	g) Exothermic reaction
	h) Reactants
	i) products

SECTION C (54 Marks)

Answer **all** questions in this section

3. Give an account of the following

- (a) Anhydrous copper (II) Sulphate becomes coloured when exposed to air for a long time
- (b) Carbon dioxide can be collected by the downward delivery method
- (c) Concentrated sulphuric acid is not used for drying hydrogen sulphide
- (d) Sodium metal is kept in paraffin oil

4. (a) A chemical manufacturing facility uses water in various industrial processes. Elaborate on the significance of implementing water treatment and purification systems

within industrial settings considering both environmental impact and the quality of water used in production.

(b) During the coagulation stage of water treatment, what is the primary purpose of adding chemicals like alum (aluminium sulphate)?

5. (a) State five characteristics of a homologous series

(b) Draw the open structure formula of 2,2-dichlorohexane

(c) Giving two reasons, explain why 2, 2-dichloro-3-methyl butane is a structural isomer of 2,2-dichloropentane

6. Sodium hydrogen carbonate (NaHCO_3) also known as baking soda reacts with vinegar (acetic acid, CH_3COOH) to produce a fizzing solution. Write the balanced ionic equation for this reaction, considering only the ionic species that participate in the reaction.

(b) At a national holiday celebration in Tanzania 500 people each enjoy a 355ml. can of fanta. If 1 mole of particles contains approximately 6.02×10^{23} particles, how many total sugar?

7. (a) Give a reason (s) for the use of carbon dioxide

i) As a fire extinguisher

ii) As a refrigerant

iii) In baking

(b) Explain what will happen when carbon monoxide reacts with

i) Oxygen

ii) Concentrated sodium hydroxide

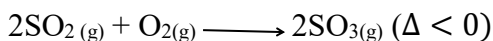
iii) Copper oxide

(c) Write the chemical equations for the reaction between

(i) Ammonia gas and hydrogen chloride

(ii) Hydrogen chloride gas and water

8.(a) The contact process involves the following equilibrium reaction



Why might a chemical plant producing sulphate acid want to remove SO_3 from the reaction mixture as soon as it is formed?

(b) Explain how the following factors affect the rate of chemicals reactions

i) Temperature

ii) Concentration

iii) Surface area

iv) Catalyst

(c) List three factors that affect the position of a chemical equilibrium

SECTION C (30 Marks)

Answer **two (2)** questions from this section

9. (a) Differentiate macronutrients from micronutrient with two examples for each

(b) Nitrogen deficiency can lead to poor yields; explain how poor crop yield is caused by nitrogen deficiency in crops.

(c) Giving two reasons, explain why crop rotation is one of the suitable methods for managing the soil.

10.(a) Define

(i) Renewable energy sources

(ii) Non-renewable sources

(b) List three examples of renewable energy sources and five example of non-renewable energy sources

(c) The following results were obtained in an experiment to measure the least value of biodiesel

Initial temperature of matter (T_0) = 24.70C

Final temperature atom o water (T_1) = 68.5 0C

Mass of biodiesel burnt = 56g

If the volume of water used in the experiment was 12 litre, determine the heat value of the biodiesel specific heat capacity of water = 4.18KJC⁻¹) density of water = 1000kg/m³)

11.(a) (i) Define the term electrolysis

(ii) List three factors which account for preferential discharge of ions during electrolysis

(b) Explain how electroplating is used to make ornament such as earrings and must watches to appear as if they are made of gold or filter.

(c) A current of 10,000A is passed through an electrolytic cell for purifying copper for 12 hours

(i) What mass of pure copper is deposited at the cathode?

(ii) What mass of aluminium would be deposited if the cell was changed to refine aluminium? (Cu=63.5, Al=27, chemical equivalent of copper = 3.290×10)



INTERSECONDARY SCHOOLS EXAMINATION SERIES
ISESE TIME TABLE
FORM TWO PRE – NATIONAL No.04
20th – 30th September 2024

DAY & DATE	MORNING SESSION (A.M)			AFTERNOON SESSION (P.M)		
	CODE NO.	SUBJECT	TIME	CODE NO.	SUBJECT	TIME
Friday 20/09/2024	013	Geography	8:00 – 10:30	011	Civics	2 : 00 - 4 :30
Monday 23/09/2024	033	Biology	8:00 – 10:30	021	Kiswahili	2 : 00 - 4 :30
Tuesday 24/09/2024	041	Basic mathematics	8:00 – 10:30	012	History	2 : 00 - 4 :30
Wednesday 25/09/2024	022	English language	8:00 – 10:30	032	Chemistry	2 : 00 - 4 :30
Thursday 26/09/2024	031	Physics	8:00 – 10:30			2 : 00 - 4 :30
Friday 27/09,2024	062	Book-keeping	8:00 – 10:30			2:00 – 4:30
Monday 30/09/2024c	061	Commerce	8:00 – 10:30			2:00 – 4:30

KUSHIRIKI PRE-NECTA HIZI WASILIANA NA COORDINATOR 0624 254 757 (UNAWEZA KUSHIRIKI SOMO MOJA AMA ZAIDI)



INTERSECONDARY SCHOOLS EXAMINATION SERIES
ISESE TIME TABLE
FORM FOUR PRE – NECTA No.04
20th – 30 September 2024

DAY & DATE	MORNING SESSION (A.M)			AFTERNOON SESSION (P.M)		
	CODE NO.	SUBJECT	TIME	CODE NO.	SUBJECT	TIME
Friday 20/09/2024	011	Civics	8:00 – 11:00	022	English	2 : 00 - 5 :00
Monday 23/09/2024	033/1	Biology 1	8:00 – 11:00	012	History	2 : 00 - 5 :00
Tuesday 24/09/2024	041	Basic mathematics	8:00 – 11:00	021	Kiswahili	2 : 00 - 5 :00
Wednesday 25/09/2024	013	Geography	8:00 – 11:00	032/1	Chemistry 1	2 : 00 - 5 :00
Thursday 26/09/2024	031/1	Physics 1	8:00 – 11:00			2 : 00 - 5 :00
Friday 27/09,2024	061	Commerce	8:00 – 11:00			2 : 00 - 5 :00
Monday 30/09/2024c	062	Book-keeping	8:00 – 11:00			2 : 00 - 5 :00

KUSHIRIKI PRE-NECTA HIZI WASILIANA NA COORDINATOR 0624 254 757 (UNaweza KUSHIRIKI SOMO MOJA AMA ZAIDI)