U7476

Reg. No.: ……..

Name:……...

University of Kerala

First Semester Degree Examination, November 2024

Four Year Under Graduate Programme

Discipline Specific Core Course

CHEMISTRY

UK1DSCCHE100 - INORGANIC CHEMISTRY I

Academic Level: 100-199

Time: 1½ Hours **Max.Marks:42**

Part A.
Answer All Questions,Objective Type. 1 Mark Each.
(Cognitive Level: Remember/Understand)
6 Marks. Time: 6 Minutes

Qn. No.	Question	Cognitive Level	Course Outcome (CO)
1.	Write Schrodinger wave equation and explain the terms.	Remember	CO-1
2.	Which among the following is a covalent compound? HCl, $Mg(OH)_2$, $CaCO_3$, NaCl	Remember	CO-2,3
3.	Which gas is primarily responsible for the greenhouse effect?	Understand	CO-4,5
4.	Suggest an external indicator for dichrometric titrations.	Understand	CO-6,7
5.	Classify the following as s, p, d and f block elements: Cr [Z=24], B [Z=5], Li [Z=3], La [Z=57]	Understand	CO-1
6.	The noncovalent bonding force that exists in solid I_2 is….	Understand	CO-2,3

Part B.
Answer All Questions,Short Answer. 2 Marks Each.
(Cognitive Level: Understand/Apply)
8 Marks. Time: 24 Minutes

Qn. No.	Question	Cognitive Level	Course Outcome (CO)
7.	Explain why the Heisenberg uncertainty principle is unimportant in the case of Macroscopic particles.	Understand	CO-1
8.	What is hybridization? Give examples for sp and sp^2 hybridizations.	Understand	CO-2,3
9.	How will you purify sea water for drinking purpose?	Apply	CO-4,5
10.	Calculate the mass of oxalic acid required to prepare 0.1 N solution of the substance in 250 ml? Calculate the weight per litre of the solution prepared.	Apply	CO-6,7

Part C.
Answer all 4 Questions, choosing among options within each question.
Long Answer. 7 marks each. (Cognitive Level: Understand/Apply/Analyze)
28 Marks. Time: 60 Minutes

Qn. No.	Question	Cognitive Level	Course Outcome (CO)
11.	a. Relate the four quantum numbers and explain their significance. OR b. Discuss the trends in electronegativity across the periodic table and how they relate to other periodic properties such as atomic radius and ionization energy.	Understand	CO-1
12.	a. Draw the MO diagram for O_2 molecule and predict the stability order for the species: O_2, O_2^+, O_2^- OR b. Apply VSEPR theory to predict the molecular geometries of SF_6, PCl_5, and NH_3, explaining how bond pairs and lone pairs influence their structures.	Apply	CO-2,3
13.	a. Analyze the duties and responsibilities of the pollution control board. OR b. Analyze the control measures for air pollution in the context of exceeding global warming levels and climatic breakdowns.	Analyze	CO-4,5
14.	a. A titration, to determine the concentration of oxalic acid ($H_2C_2O_4$) using a standard sodium hydroxide (NaOH) solution with a concentration of 0.1 M, phenolphthalein was used as the indicator and observes a colour change at the endpoint. 1. If the volume of oxalic acid solution used in the titration is 25.0 mL and it takes 20.0 mL of NaOH to reach the endpoint, calculate the concentration and weight per litre of the acid solution. 2. Discuss how the choice of indicator (phenolphthalein) affects the accuracy of this titration and what are the possible implications, if a different indicator is used. OR b. Explain the theory of complexometric titrations using EDTA with suitable examples of indicators.	Analyze	CO-6,7

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Reg. No.: ……..

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University of Kerala

First Semester Degree Examination, November 2024

Four Year Under Graduate Programme

Discipline Specific Core Course

CHEMISTRY

UK1DSCCHE101 - FUNDAMENTALS OF CHEMISTRY I

Academic Level: 100-199

Time: 1½ Hours **Max.Marks:42**

Part A.
Answer All Questions, Objective Type. 1 Mark Each.
(Cognitive Level: Remember/Understand)
6 Marks. Time: 6 Minutes

Qn. No.	Question	Cognitive Level	Course Outcome (CO)
1.	What quantum number indicates the shape of an orbital?	Remember	CO-1
2.	Calculate the bond order of O_2^+.	Remember	CO-2,3
3.	State second law of thermodynamics?	Understand	CO-4
4.	Name an internal redox indicator	Understand	CO-5,6
5.	What is the molecular geometry for ammonia?	Understand	CO-2,3
6.	What is entropy?	Understand	CO-4

Part B.
Answer All Questions, Short Answer. 2 Marks Each.
(Cognitive Level: Understand/Apply)
8 Marks. Time: 24 Minutes

Qn. No.	Question	Cognitive Level	Course Outcome (CO)
7.	Explain Hund's rule with an example.	Understand	CO-1
8.	Give explanations for the observed bond angle in water?	Understand	CO-2,3
9.	Calculate the bond energy for H-Cl bond. Given that the enthalpies of formation of HCl(g), H(g) and Cl(g) are -92.2 $kJmol^{-1}$, 217 $kJmol^{-1}$ and 121.4 $kJmol^{-1}$.	Apply	CO-4
10.	25 ml H_2SO_4 solution required 48.75 ml of 0.02 M NaOH for complete titration. Calculate the molarity of H_2SO_4.	Apply	CO-5,6

Part C.
Answer all 4 Questions, choosing among options within each question.
Long Answer. 7 marks each. (Cognitive Level: Understand/Apply/Analyze)
28 Marks. Time: 60 Minutes

Qn. No.	Question	Cognitive Level	Course Outcome (CO)
11.	a. Write the electronic configuration of copper (Z=29). Explain the rules you followed for it. OR b. Discuss the significance of quantum numbers and write the n, l and m values of 3s electrons.	Understand	CO-1
12.	a. Predict the geometry and shape of ethane, ethene and ethyne molecules from the type of hybridization? OR b. Apply Born-Haber cycle, for the calculation of lattice energy of $MgCl_2$. Give the significance of lattice energy in solids.	Apply	CO-2,3
13.	a. How can you correlate molar heat capacities with ΔU and ΔH? Discuss about the significance of Kirchoff's equation. OR b. i. Predict the feasibility of a process using different thermodynamic conditions. (3 marks) ii. Enthalpy and entropy changes of a reaction are 40.63 kJ mol^{-1} and 108.8 JK^{-1} mol^{-1} respectively. Predict the feasibility of the reaction at 27°C. (4 marks)	Apply	CO-4
14.	a. What are acid-base indicators? Discuss and analyse their use in the titration curves for the titration of i) a strong acid with a strong base ii) a weak acid with a strong base iii) a strong acid with a weak base OR b. Analyze the role of the common ion effect in the precipitation reactions during inorganic qualitative analysis and evaluate its impact on the solubility of salts and the separation of cations in a solution.	Analyze	CO-5,6

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Reg. No.: ……..

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University of Kerala
First Semester Degree Examination, November 2024
Four Year Under Graduate Programme
Discipline Specific Core Course
CHEMISTRY
UK1DSCCHE101 - FUNDAMENTALS OF CHEMISTRY I
Academic Level: 100-199

Time: 1½Hours **Max.Marks:42**

Part A.
Answer All Questions, Objective Type. 1 Mark Each.
(Cognitive Level: Remember/Understand)
6 Marks. Time: 6 Minutes

Qn. No.	Question	Cognitive Level	Course Outcome (CO)
1.	What is Hund's rule?	Remember	CO-1
2.	The rule governing the covalent character in an ionic bond is termed as---------	Remember	CO-2,3
3.	Write down the expression for first law of thermodynamics.	Understand	CO-4
4.	What is meant by a primary standard?	Understand	CO-5,6
5.	What will be the geometry of a molecule with Three bonding pairs and no lone pairs on the central atom?	Understand	CO-2,3
6.	Which among the molecules - CCl_4, BF_3, CO_2, XeF_2 - has a bond angle closest to 120°?	Understand	CO-2,3

Part B.

Answer All Questions, Short Answer. 2 Marks Each.
(Cognitive Level: Understand/Apply)
8 Marks. Time: 24 Minutes

Qn. No.	Question	Cognitive Level	Course Outcome (CO)
7.	How does ionization enthalpy vary along a period and Group	Understand	CO-1
8.	What is meant by Hydrogen bond. Mention its two types	Understand	CO-2,3
9.	How does ionization enthalpy vary along a period and Group	Apply	CO-4
10.	Write down principle and applications of TLC?	Apply	CO-5,6

Part C.
Answer all 4 Questions, choosing among options within each question.
Long Answer. 7 marks each. (Cognitive Level: Understand/Apply/Analyze)
28 Marks. Time: 60 Minutes

Qn. No.	Question	Cognitive Level	Course Outcome (CO)
11.	a. What are quantum numbers and their significance? OR b. Write the electronic configuration of gallium (Z=31). Justify your answer with the rules of filling electrons in atomic orbitals.	Understand	CO-1
12.	a. Apply the concept of hybridization and predict the geometry of ethane, ethene and ethyne. OR b. Write a brief note on the molecular orbital approach of O_2, O_2^- and O_2^+. Also predict the bond order and stability.	Apply	CO-2,3
13.	a. Derive an equation that relates enthalpy change of a reaction with temperature. The heat of reaction, $N_2 + 3H_2 \rightarrow 2NH_3$ at 27°C was found to be -21.976 kcal. What will be the heat of reaction at 50°C. the molar heat capacities at constant pressure and at 27°C for nitrogen, hydrogen and ammonia are 6.8, 6.77 and 8.86 cal mol^{-1} $degree^{-1}$. OR b. Gibb's – Helmholtz equation helps to predict the spontaneity of a process. Justify	Apply	CO-4
14.	a. Analyze the selection of suitable indicators for different acid- base titrations? Justify your answer with the help of titration curves. OR b. Analyze the role of the common ion effect in the precipitation reactions during inorganic qualitative analysis and evaluate its impact on the solubility of salts and the separation of cations in a solution.	Analyze	CO-5,6

U7500

Reg. No.: ……..

Name:……...

University of Kerala

First Semester Degree Examination, November 2024

Four Year Under Graduate Programme

Discipline Specific Core Course

CHEMISTRY

UK1DSCCHE102 - CHEMICAL FRONTIERS – BONDING TO ENVIRONMENTAL PERSPECTIVES

Academic Level: 100-199

Time:1½ Hours **Max.Marks: 42**

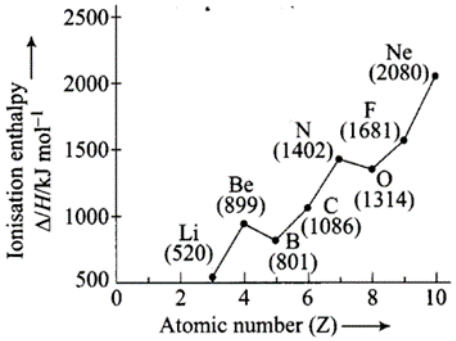
Part A.
Answer All Questions, Objective Type. 1 Mark Each.
(Cognitive Level: Remember/Understand)
6 Marks. Time: 6 Minutes

Qn. No.	Question	Cognitive Level	Course Outcome (CO)
1.	Name the block in the periodic table where elements with the outer electronic configuration ns^2np^5 are found.	Remember	CO-1
2.	What is the hybridization in IF_7 molecule?	Remember	CO-2,3
3.	Define an organometallic compound.	Understand	CO-4
4.	What do you understand by the term BOD?	Understand	CO-5,6,7
5.	What do you understand by intramolecular hydrogen bonding?	Understand	CO-2
6.	Name two major causes of air pollution.	Understand	CO-7

Part B.
Answer All Questions, Short Answer. 2 Marks Each.
(Cognitive Level: Understand/Apply)
8 Marks. Time: 24 Minutes

Qn. No.	Question	Cognitive Level	Course Outcome (CO)
7.	Define oxidation state and give an example of an element that exhibits multiple oxidation states.	Understand	CO-1
8.	Explain briefly the applications of organometallic compounds in agriculture?	Understand	CO-4
9.	Define Born Haber Cycle and explain how it can explain stability of NaCl.	Apply	CO-2,3
10.	Find the molarity of a solution of H_2SO_4 having 4.9g of it dissolved in 500 mL of solution?	Apply	CO-5,6,7

Part C.
Answer all 4 Questions, choosing among options within each question.
Long Answer. 7 marks each. (Cognitive Level: Understand/Apply/Analyze)
28 Marks. Time: 60 Minutes

Qn. No.	Question	Cognitive Level	Course Outcome (CO)
11.	a. i. Explain Pauli's Exclusion Principle and Hund's Rule, and describe how these principles contribute to the arrangement of electrons in orbitals. (4 marks) ii. Discuss the stability associated with completely filled and half-filled orbitals, providing examples to illustrate this concept. (3 marks) OR b. Define ionization enthalpy. Explain how ionization enthalpy vary across a period in a periodic table. Discuss the trend using the elements of second period as example. 	Understand	CO-1
12.	a. Discuss the biological and environmental aspects of organometallic compounds. OR b. Examine the general characteristics of organometallic compounds that contribute to their medicinal use, and explain how these compounds differ in their therapeutic mechanisms.	Understand	CO-4
13.	a. Apply your understanding of molecular geometry and dipole moments to compare polar and nonpolar molecules, using NH_3 and CO_2 as specific examples. How do their geometries and dipole moments determine their polarity? OR	Apply	CO-2,3

	b. A hypothetical molecule, XY_4, has a tetrahedral geometry. Based on this information, predict the hybridization of the central atom (X), the bond angles within the molecule, and the number of lone pairs on the central atom. Explain your reasoning using VSEPR theory.		
14.	a. How does the redox potential of the $Fe^{2+}/Cr_2O_7^{2-}$ system influence the suitability of diphenylamine as an indicator in redox titration? OR b. Analyze the greenhouse effect and its intensification due to human activities, specifically examining the contributions of CO_2, methane, and CFCs, and assess the potential long-term impacts on global climate.	Analyze	CO-5,6,7

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Reg. No.: ……..

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University of Kerala

First Semester Degree Examination, November 2024

Four Year Under Graduate Programme

Discipline Specific Core Course

CHEMISTRY

UK1DSCCHE102 - CHEMICAL FRONTIERS – BONDING TO ENVIRONMENTAL PERSPECTIVES

Academic Level: 100-199

Time: 1½ Hours **Max.Marks: 42**

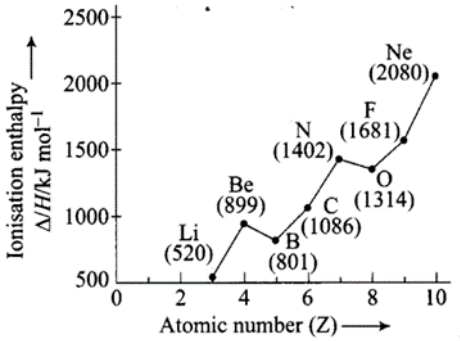
Part A.
Answer All Questions, Objective Type. 1 Mark Each.
(Cognitive Level: Remember/Understand)
6 Marks. Time: 6 Minutes

Qn. No.	Question	Cognitive Level	Course Outcome (CO)
1.	Which quantum number specifies the energy level of an electron in an atom?	Remember	CO-1
2.	Which will be more stable-O_2 or O_2^+?	Remember	CO-2,3
3.	Give two examples of organo mercury compounds in medicine.	Understand	CO-4
4.	Name a gas responsible for greenhouse effect.	Understand	CO-5,6,7
5.	Suggest an internal indicator for dichrometric titrations.	Understand	CO-5,6,7
6.	What is BOD?	Understand	CO-5,6,7

Part B.
Answer All Questions, Short Answer. 2 Marks Each.
(Cognitive Level: Understand/Apply)
8 Marks. Time: 24 Minutes

Qn. No.	Question	Cognitive Level	Course Outcome (CO)
7.	How do the magnetic quantum number (m_l) and the angular momentum quantum number (l) relate to orbitals?	Understand	CO-1
8.	Organoboron compounds find application in cancer therapy. Why?	Understand	CO-4
9.	Although the hybridization of central atom of NH_3 and CH_4 molecules are same, bond angle in ammonia is less than that in methane. Why?	Apply	CO-2,3
10.	Calculate the normality of 10% solution of NaOH.	Apply	CO-5,6,7

Part C.
Answer all 4 Questions, choosing among options within each question.
Long Answer. 7 marks each. (Cognitive Level: Understand/Apply/Analyze)
28 Marks. Time: 60 Minutes

Qn. No.	Question	Cognitive Level	Course Outcome (CO)
11.	a. (i) Using energy sequence rule, write down the ground state electronic configuration of Cu (Z=29). Why is the configuration you have written more preferred? (2 marks) (ii) State the rules behind the electronic configuration of an atom. (3 marks) (iii) Write the four quantum numbers for 3d orbital of Cu. (2 marks) OR b. Explain how ionization enthalpy vary across a period in a periodic table. Discuss the trend using the elements of second period as example.  	Understand	CO-1
12.	a. Outline the applications of organometallics in agriculture and horticulture. OR b. i) What will be the products when acetaldehyde reacts with ethyl magnesium bromide? (3 marks) ii) Illustrate the properties of the organometallic compounds. (4 marks)	Understand	CO-4
13.	a. Apply the principles of molecular orbital theory to construct and compare the molecular orbital diagrams of O_2 and CO, and analyze how differences in electronegativity affect the shape and energy levels of their molecular orbitals.	Apply	CO-2,3

	OR b. Apply your understanding of molecular geometry and dipole moments to compare polar and nonpolar molecules, using NH_3 and CO_2 as specific examples. How do their geometries and dipole moments determine their polarity?		
14.	a. Analyze the role of indicators in acid-base titrations, theory of indicators and how they are used to determine the endpoint of a titration. OR b. Analyze different methods for the treatment of industrial waste water.	Analyze	CO-5,6,7

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Reg. No.: ……..

Name:……...

University of Kerala

First Semester Degree Examination, November 2024

Four Year Under Graduate Programme

Discipline Specific Core Course

CHEMISTRY

UK1DSCCHE103 - FOUNDATIONS OF INORGANIC & POLYMER CHEMISTRY

Academic Level: 100-199

Time: 1½ Hours **Max.Marks:42**

Part A.
Answer All Questions, Objective Type. 1 Mark Each.
(Cognitive Level: Remember/Understand)
6 Marks. Time: 6 Minutes

Qn. No.	Question	Cognitive Level	Course Outcome (CO)
1.	What is the shape of an s orbital?	Remember	CO-1,2
2.	What is the primary cause of acid rain?	Remember	CO-3
3.	What is condensation polymerization? Give an example.	Understand	CO-4
4.	How are primary and secondary standards differed?	Understand	CO-5,6
5.	How do systematic errors affect the accuracy of an analysis?	Understand	CO-5,6
6.	What is the significance of vulcanization in the processing of natural rubber?	Understand	CO-4

Part B.
Answer All Questions, Short Answer. 2 Marks Each.
(Cognitive Level: Understand/Apply)
8 Marks. Time: 24 Minutes

Qn. No.	Question	Cognitive Level	Course Outcome (CO)
7.	What does Heisenberg's Uncertainty Principle state?	Understand	CO-1,2
8.	How does the depletion of the ozone layer affect life on Earth?	Understand	CO-3
9.	Which type of polymer would you recommend for making stretchy clothing material, and why?	Apply	CO-4
10.	In a titration between NaOH and HCl, how would you determine the end point?	Apply	CO-5,6

Part C.
Answer all 4 Questions, choosing among options within each question.
Long Answer. 7 marks each. ,(Cognitive Level: Understand/Apply/Analyze)
28 Marks. Time: 60 Minutes

Qn. No.	Question	Cognitive Level	Course Outcome (CO)
11.	a. Explain how an acid-base indicator works and give examples of indicators used in acid-base titrations. OR b. Describe the methods of expressing the concentration of solutions and their relevance in chemical analysis.	Understand	CO-5,6
12.	a. Explain how the greenhouse gases contribute to the greenhouse effect and global warming. OR b. How would you apply reverse osmosis (RO) to desalinate seawater for drinking purposes? Explain the operational principle and how it can be used in a large-scale plant.	Apply	CO-3
13.	a. Explain the synthesis and applications of melamine-formaldehyde resins and compare them with phenol-formaldehyde resins. OR b. Propose a strategy for reducing the environmental hazards caused by synthetic polymers, focusing on the biodegradability and recycling of plastics.	Apply	CO-4
14.	a. Analyze the Aufbau principle, Hund's rule, and Pauli's exclusion principle in predicting electronic configurations of atoms. OR b. Analyse the classification of elements in modern periodic law and how it corrected the limitations of Mendeleev's periodic table.	Analyze	CO-1,2

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Reg. No.: ……..

Name:……...

University of Kerala

First Semester Degree Examination, November 2024

Four Year Under Graduate Programme

Discipline Specific Core Course

CHEMISTRY

UK1DSCCHE103 - FOUNDATIONS OF INORGANIC & POLYMER CHEMISTRY

Academic Level: 100-199

Time: 1½ Hours **Max.Marks: 42**

Part A.
6 Marks. Time: 6 Minutes
Objective Type. 1 Mark Each. Answer All Questions
(Cognitive Level: Remember/Understand)

Qn. No.	Question	Cognitive Level	Course Outcome (CO)
1.	What does the principal quantum number (n) indicate?	Remember	CO-1,2
2.	What is acid rain?	Remember	CO-3
3.	What is copolymer?	Understand	CO-4
4.	What is meant by standardization of solution?	Understand	CO-5,6
5.	Why is it important to consider significant digits in scientific calculations?	Understand	CO-5,6
6.	Give an example for polyamide.	Understand	CO-4

Part B.
Answer All Questions, Short Answer. 2 Marks Each.
(Cognitive Level: Understand/Apply)
8 Marks. Time: 24 Minutes

Qn. No.	Question	Cognitive Level	Course Outcome (CO)
7.	What is the significance of the de Broglie equation?	Understand	CO-1,2
8.	What is the greenhouse effect, and how does carbon dioxide (CO_2) contribute to it?	Understand	CO-3
9.	How can you differentiate between condensation and addition polymerization using an example of each?	Apply	CO-4
10.	Explain how you would prepare 1 L of a 0.1 M NaOH solution using a solid NaOH sample.	Apply	CO-5,6

Part C.
Answer all 4 Questions, choosing among options within each question.
Long Answer. 7 marks each. (Cognitive Level: Understand/Apply/Analyze)
28 Marks. Time: 60 Minutes

Qn. No.	Question	Cognitive Level	Course Outcome (CO)
11.	a. Describe the process of preparing a standard solution, and explain the criteria for selecting a primary standard. OR b. Describe the general principles of volumetric analysis and the importance of the endpoint in titration.	Understand	CO-5,6
12.	a. Apply the concept of industrial waste treatment using activated charcoal and synthetic resins. OR b. How do agricultural pollutants such as pesticides and fertilizers affect soil and water quality?	Apply	CO-3
13.	a. Compare the properties of linear and cross-linked polymers and their applications. OR b. Explain how the properties of synthetic polymers like SBR and neoprene are applied in the design of industrial products, and propose improvements for better performance.	Apply	CO-4
14.	a. Analyze the role of quantum numbers in determining the energy and spatial distribution of electrons in an atom. OR b. Compare the shapes of s, p, and d orbitals and analyze their importance in chemical bonding.	Analyze	CO-1,2

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Reg. No.: ……..

Name:……...

University of Kerala
First Semester Degree Examination, November 2024
Four Year Under Graduate Programme
Discipline Specific Core Course
CHEMISTRY
UK1DSCCHE105 - GENERAL CHEMISTRY I
Academic Level: 100-199

Time:1½ Hours **Max.Marks: 42**

Part A.
Answer All Questions
Objective Type. 1 Mark Each.
(Cognitive Level: Remember/Understand)
6 Marks. Time: 6 Minutes

Qn. No.	Question	Cognitive Level	Course Outcome (CO)
1.	What do we call a systematic investigation to test a hypothesis?	Remember	CO-1,2
2.	Who synthesized urea from inorganic compounds?	Remember	CO-3
3.	What is the main active ingredient in most toothpastes that helps prevent cavities?	Understand	CO-4
4.	PPE stands for ---------	Understand	CO-5,6
5.	What is the first step in the scientific method?	Understand	CO-1,2
6.	What type of reaction involves the loss of electrons?	Understand	CO-5,6

Part B.
Answer All Questions
Short Answer. 2 Marks Each.
(Cognitive Level: Understand/Apply)
8 Marks. Time: 24 Minutes

Qn. No.	Question	Cognitive Level	Course Outcome (CO)
7.	Discuss about inductive and deductive reasoning.	Understand	CO-1,2
8.	What was J.J. Thomson's major contribution to atomic theory, and how did it change the understanding of atomic structure?	Understand	CO-3
9.	Discuss the potential hazards of using cooking gas in the kitchen. What two safety measures can you implement to minimize these risks?	Apply	CO-4
10.	Using the dilution formula (C1V1 = C2V2), determine how to dilute 100 mL of a 2 M hydrochloric acid (HCl) solution to obtain a 0.5 M solution.	Apply	CO-5,6

Part C.
Answer all 4 Questions, choosing among options within each question.
(Cognitive Level: Understand/Apply/Analyze)
Long Answer. 7 marks each.
28 Marks. Time: 60 Minutes

Qn. No.	Question	Cognitive Level	Course Outcome (CO)
11.	a. Outline the steps of the scientific method. How does each step contribute to the formulation of scientific knowledge? OR b. How does chemistry connect to physics, biology, and other scientific disciplines?	Understand	CO-1,2
12.	a. How the collective contributions of women scientists like Franklin, Ball, Hodgkin, and Elion have transformed the field of chemistry. What strategies can be implemented to encourage more women to pursue careers in science? OR b. Discuss the significance of Dmitri Mendeleev's periodic table in predicting the properties of undiscovered elements. Apply this understanding to how the periodic table is used today in field like nanotechnology.	Apply	CO-3
13.	a. What safety precautions should be taken when using household bleach for cleaning. Discuss at least three specific safety measures, their importance, and potential consequences of neglecting these precautions. OR b. How the safety protocols involved in the disposal of hazardous household materials, such as expired cleaning products or leftover firecrackers. Discuss the consequences of improper disposal and recommend safe disposal methods.	Apply	CO-4
14.	a. Analyze the process of volumetric analysis in acid-base titrations. Analyze the steps involved in conducting a titration and how to accurately determine the endpoint using indicators. OR b. Analyze the role of the common ion effect and solubility product in qualitative analysis. Discuss how these concepts influence the separation of cations during experiments.	Analyze	CO-5,6

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Reg. No.: ……..

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University of Kerala
First Semester Degree Examination, November 2024
Four Year Under Graduate Programme
Discipline Specific Core Course
CHEMISTRY
UK1DSCCHE105 - GENERAL CHEMISTRY I
Academic Level: 100-199

Time:1½ Hours **Max. Marks:42**

Part A.
Answer All Questions
Objective Type. 1 Mark Each.
(Cognitive Level: Remember/Understand)
6 Marks. Time: 6 Minutes

Qn. No.	Question	Cognitive Level	Course Outcome (CO)
1.	How does observation differ from an experiment?	Remember	CO-1,2
2.	Which scientist won Nobel prize for Chemistry and peace?	Remember	CO-3
3.	What is one benefit of using fluoride in toothpaste?	Understand	CO-4
4.	What does MSDS stand for?	Understand	CO-5,6
5.	What is deductive reasoning?	Understand	CO-1,2
6.	Name an acid-base indicator that changes color around pH 7?	Understand	CO-5,6

Part B.
Answer All Questions
Short Answer. 2 Marks Each.
(Cognitive Level: Understand/Apply)
8 Marks. Time: 24 Minutes

Qn. No.	Question	Cognitive Level	Course Outcome (CO)
7.	What are the main ingredients found in most shampoos, and how do they contribute to hair cleaning?	Understand	CO-4
8.	What immediate steps should be taken if someone receives an electric shock in the lab? Describe two actions.	Understand	CO-5,6
9.	Give an example of a specific chemical technique and its application in assessing water quality.	Apply	CO-1,2
10.	What was Joseph Priestley's key discovery, and why is it considered important in the history of chemistry?	Apply	CO-3

Part C.
Answer all 4 Questions, choosing among options within each question.
Long Answer. 7 marks each.
(Cognitive Level: Understand/Apply/Analyze)
28 Marks. Time: 60 Minutes

Qn. No.	Question	Cognitive Level	Course Outcome (CO)
11.	a. What are the primary branches of chemistry, and how do they interrelate with each other? OR b. Reflect on the significance of scientific literacy in society. How can understanding the scientific method and chemistry benefit individuals and communities?	Understand	CO-1,2
12.	a. What are the major contributions of Antoine Lavoisier, John Dalton and J. J. Thomson? OR b. Explore how Marie Curie's discoveries in radioactivity have influenced both chemistry and physics. How can her work be connected to current advancements in nuclear medicine and energy research?	Apply	CO-3
13.	a. Discuss how the chemical structure of detergents enables them to remove stains and grease from various surfaces. Provide examples of specific types of stains that detergents are particularly effective against. OR b. Analyze the chemical reactions of firecrackers. Discuss the importance of following safety guidelines when handling firecrackers and provide examples of such guidelines.	Apply	CO-4
14.	a. What steps would you take to handle an electric shock incident in the lab? Outline a basic first aid response. OR b. Describe the process of a redox titration. Which indicators can be used, and how do you determine the endpoint of the titration? Illustrate using potassium permanganate ($KMnO_4$) and iron(II) sulfate ($FeSO_4$) titration as an example.	Analyze	CO-5,6