



U7495

Reg. No.:

Name:.....



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, $\text{N}_2 + 3\text{H}_2 \rightarrow 2\text{NH}_3$ 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