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