


Name:			
Enrolment No:			
UNIVERSITY OF PETROLEUM AND ENERGY STUDIES End Semester Examination, May 2022			
Course: Inorganic Chemistry-IV Program: B. Sc (H) Chemistry Course Code: CHEM-3003		Semester: VI Time : 03 hrs. Max. Marks: 100	
Instructions: There shall be three Sections (Section A, Section B and Section C) in the Question Paper & TWO pages. Section A contains 5 Questions of 4 marks each. Section B- This section shall have 4 Questions of 10 marks each, out of which 3 Questions shall be compulsory and 1 Questions shall have internal choice Section C shall have 2 Questions of 20 marks each, out of which 1 Question shall be compulsory and 1 Question shall have internal choice			
SECTION A (5Qx4M=20Marks)			
S. No.		Marks	CO
Q 1	Describe principles of common ion effect and solubility product in qualitative analysis of inorganic salt.	4	CO1
Q 2	(i) What are chemically possible models for O ₂ binding to iron centre in hemoglobin. (ii) What are the functions of globin in heme oxygenation?	2+2	CO3
Q 3	Follow 18 e ⁻ rule and Predict sum of valence electrons of metal in the following compounds (i) Fe ₂ (CO) ₉ (ii) [Mo(CO) ₃ (η ⁶ C ₇ H ₈)]	2+2	CO2
Q 4	What do you understand by Sodium Potassium pump? Illustrate with the help of diagram	4	CO3
Q 5	Explain Ziegler-Natta Catalysts and different applications of all generations of these catalyst	4	CO2
SECTION B: internal choice is given in Q 9 (4Qx10M= 40 Marks)			
Q 6	Write detailed qualitative analysis for the detection of anion and cation in the salt (NH ₄) ₃ PO ₄ (with preliminary and confirmation tests for both acid and basic radicals).	10	CO1
Q 7	The following biological reactions involve metal ions. Recognize as essential elements(role of metals in bioactive substances): i. Electron carriers ii. Metal storage compound.	10	CO3

	iii. Oxygen transportation agent iv. Photosynthesis v. Hydrolase. vi. Oxidoreductase. vii. Isomerase.		
Q 8	How organometallic compounds classified based on the nature of bonding?	10	CO2
Q 9	Draw the structure of the following compounds. (a) Ni(CO) ₄ (b) Fe ₂ (CO) ₉ (c) Co ₂ (CO) ₈ (d) Fe(CO) ₅ <p style="text-align: center;">or</p> What are metal carbonyls? Give structures of two dinuclear metal carbonyls having different structure.	10	CO2
SECTION-C: internal choice is given in Q 11 (2Qx20M=40 Marks)			
Q 10	Write short notes on the following: (a) acetylation of ferrocene (b) Back bonding of metal carbonyls (c) β-elimination of metal alkyls.	10+5+5	CO2
Q 11	(a) Draw a cyclic process showing role of Hb (hemoglobin) and Mb (myoglobin) as oxygen and CO ₂ transporters. (b) What is the biological role of Zn ²⁺ . <p style="text-align: center;">or</p> (a) Name at least two oxygen carriers and give their importance in biological systems (b) What are the functions of myoglobin?	10+10	CO3