24P1005

M.Sc. DEGREE END SEMESTER EXAMINATION - NOVEMBER 2024 SEMESTER 1 : CHEMISTRY / PHARMACEUTICAL CHEMISTRY

COURSE : 24P1CHET01/ 24P1CPHT01 ; INORGANIC CHEMSITRY - 1

(For Regular - 2024 admission)

Duration : Three Hours		Max. Weights: 30	
	PART A		
	Answer any 8 questions	Weight: 1	
1.	Write down the synthesis of transuranic elements nobelium and lawrencium.	(U, CO 4)	
2.	Explain light and dark reactions in photosynthesis.	(U, CO 3)	
3.	Predict the major products in the following reactions.		
	(a) $(\eta^5 - C_5 H_5) (\eta^1 - C_3 H_5) Fe(CO)_2 \rightarrow^{h\upsilon}$ (b) V(CO) ₆ + NO →	(A, CO 1)	
4.	What is Wulff–Dötz reaction?	(R, CO 2)	
5.	Free alkenes are unreactive towards nucleophiles, but on co – ordination metal center, alkenes react with nucleophiles. Why?	to (A, CO 1)	
6.	Give the name and function of two zinc containing enzymes.	(U, CO 3)	
7.	What are ionophores?	(U, CO 3)	
8.	$AlCl_3$ + alkylaluminiumchloride is a good Zeigler-Natta cataly whereas NilCl ₂ + alkylaluminium chloride is not a good Zeigler-Na polymerisation catalyst. Explain why?		
9.	The C=C stretch in the anion of Zeise's salt is at 1516 cm ⁻¹ in comparison with 1623 cm ⁻¹ in free ethylene. Why?	(An, CO 1)	
10.	The complex bromocarbonylbis(tri-phenylphosphine)iridium(I) undergoes addition reaction quite readily with chloro methane. Why?	(An, CO 1)	
		(1 x 8 = 8)	
	PART B Answer any 6 questions	Weights: 2	
11.	What is plastocyanin? Give a brief account of its structure and function.	(U, CO 3)	
11. 12.	Draw the structure of $K[PtCl_3(C_2H_4)]$. How is the synergic effect occurs in		
12.	these compounds?	(A, CO 1)	
13.	Discuss the mechanism of radiation polymerization initiated by ionizing radiation. How does the type of radiation and its energy influence the polymerization process?	(An, CO 4)	
14.	Describe the mechanism involved in dehydrogenation of cyclooctane to cyclooctene using Iridium pincer complex.	(U, CO 2)	
15.	Write a note on iron sulphur proteins.	(U, CO 3)	
16.	Discuss the isotopic method of determination of diffusion constant.	(U, CO 4)	
17.	What is platinum POP? Explain the mechanism of photo dehydrogenati using POP catalyst.		
18	How is Zaize's salt synthesized? Describe the Dewar- Chatt-Duncanson		

How is Zeize's salt synthesized? Describe the Dewar- Chatt-Duncanson (A, CO 1) bonding model present in it.
(2 x 6 = 12)

	PART C	
	Answer any 2 questions	Weights: 5
19.	Using molecular orbital theory as a guideline, illustrate the bonding present in dibenzene chromium.	(An, CO 1)
20.	What are Tollman catalytic loops? Sketch the loop and explain the mechanism of alkene hydrogenation using Wilkinson's catalyst. Discuss the applications of Wilkinson's catalyst.	(U)
21.	Explain following reactions of Organometallic compounds with suitable examples. (a) Oxidative addition (b) Binuclear reductive elimination.	()
22.	Discuss in detail about Photosystem I and Photosystem II with the aid of Z-scheme.	(A, CO 3) (5 x 2 = 10)

OBE: Questions to Course Outcome Mapping

CO	Course Outcome Description	CL	Questions	Total Wt.
CO 1	Describe the key concepts of inorganic and organometallic chemistry including those related to synthesis, reaction chemistry, and structure and bonding.	U	3, 5, 9, 10, 12, 18, 19	13
CO 2	Explain stability of organometallic compounds and clusters, and their application as industrial catalysts.	А	4, 8, 14, 17	6
CO 3	Recognize and explain the interaction of different metal ions with biological ligands	U	2, 6, 7, 11, 15, 21	12
CO 4	Demonstrate a systematic understanding of the key aspects of nuclear chemistry and their analytical applications.	U	1, 13, 16	5

Cognitive Level (CL): Cr - CREATE; E - EVALUATE; An - ANALYZE; A - APPLY; U - UNDERSTAND; R - REMEMBER;