Reg.No. _____

Karunya UNIVERSITY

(Karunya Institute of Technology & Sciences)
(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

End Semester Examination – Nov/Dec – 2016

Code : 15CH3008 **Semester : 2016-17 ODD**
Sub. Name : Organometallic, Bioinorganic and Solid State Chemistry **Duration : 3hrs**
Max. marks : 100

ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)

Q. No.	Sub Div.	Questions	Course Outcome	Marks
1.	a.	Write down the number of electrons donated by the ligands in ionic and covalent models. (i) CO (ii) Allyl	CO1	2
	b.	Match the C-O bond with their corresponding IR frequency. (a) Bridging carbonyl group (i) 2143 cm^{-1} (b) Carbon Monoxide (ii) 1800 ± 75 cm^{-1} (c) Teminal carbonyl group (iii) 1715 ± 10 cm^{-1} (d) Saturated Ketone (iv) 2000 ± 100 cm^{-1}	CO1	4
	c.	Define the isolobal concept. Write an example.	CO1	4
	d.	Explain the preparation and reactions of ferrocene.	CO1	10
		(OR)		
2.	a.	Find out the number of M-M bonds for the following molecules. (i) $Co_2(CO)_8$ (ii) $Fe_3(CO)_{12}$	CO1	4
	b.	Explain the preparation of metal carbonyl and metal carbonylate anions.	CO1	6
	c.	What are the types of metal carbene complexes? How are they prepared? Discuss their structure and applications.		10
3.	a.	Write the preparation and reactions of metal-arene complexes.	CO1	5
	b.	Explain the insertion reaction with one example.	CO1	3
	c.	Write the hydroformylation reaction. Draw the catalytic cycle and explain the various steps involved.	CO1	12
		(OR)		
4.	a.	What is meant by coordinative unsaturation? Explain.	CO1	5
	b.	Explain the migration reaction with one example.	CO1	3
	c.	Write the reaction involved in Wacker Process. Draw the catalytic cycle and explain the various steps involved.	CO1	12
5.	a.	Compare the thermal and photochemical excitation of a coordination complex with an example.	CO1	4
	b.	State Adamson's rule.	CO1	4
	c.	Write a detailed account on Photoredox reactions.	CO1	12
		(OR)		
6.	a.	Explain the photodissociation process with an example.	CO1	4
	b.	Write a short note on photochemical conversion and storage of solar energy'	CO1	6
	c.	Discuss the photosubstitution reactions carried out in coordination complexes.		10
7.	a.	Match the metal with their corresponding enzymes/systems. (a) Cobalt (i) Carboxy peptidase (b) Zinc (ii) Coenzyme B12 (c) Iron (iii) Carbonic anhydrase (d) Manganese (iv) Methyl cobalamin (v) Hydrogenase (vi) Photosystem-II	CO1	4

	b.	Write a short note on blue – copper proteins.	CO1	**4**
	c.	Write a detailed account on fixation of molecular nitrogen.	CO1	**12**
		(OR)		
8.	a.	Draw the structures of Ferridoxin and Rubridoxin.	CO1	**2**
	b.	Discuss the oxygen binding process in hemoglobin and myoglobin.	CO1	**8**
	c.	With examples, explain the mechanism of platinum anticancer drug.	CO1	**10**
		Compulsory:		
9.	a.	Describe the close packing in ionic solids.	CO1	**8**
	b.	Write a detailed accont on band theory of solids.	CO1	**12**

ALL THE BEST