

--	--	--	--	--	--	--	--	--	--



**DHANALAKSHMI SRINIVASAN COLLEGE
OF ARTS & SCIENCE FOR WOMEN
(AUTONOMOUS)**

(For Candidates admitted from 2020-2021 onwards)

PG DEGREE EXAMINATIONS APRIL - 2021

M.Sc., - CHEMISTRY

INORGANIC CHEMISTRY - II



Time: 3 Hrs

Max.Marks: 75

PART - A

CHOOSE THE CORRECT ANSWER

(10X1=10)

- Which type of boranes are B_5H_9 and B_4H_{10} respectively?
 - Nido and Arachano boranes
 - Nido and closo boranes
 - Closo and Arachano boranes
 - Both are Nido
- $W_4(OR)_{16}$ is an example of _____
 - dinuclear clusters
 - trinuclear clusters
 - tetranuclear clusters
 - hexanuclear clusters
- $Mn(CO)_5$ is isolobal with which of the following compound?
 - CH_4
 - CH_3
 - CH_2
 - CH
- Which of the following is the neutral complex which follows the 18- electron rule?
 - $(\eta^5-C_5H_5)Fe(CO)_2$
 - $(\eta^5-C_5H_5)_2Mo(CO)_3$
 - $(\eta^5-C_5H_5)_2Co$
 - $(\eta^5-C_5H_5)_2Re(\eta^6-C_6H_6)$
- Which one of the following is Vaska's complex?
 - $K_4[Fe(CN)_6]$
 - $[(PPh_3)_3RhCl]$
 - trans- $\{IrCl(CO)(PPh_3)_2\}$
 - cis - $\{IrCl(CO)(PPh_3)_2\}$
- EAN of Co in $[Co(NH_3)_6]^{3+}$
 - 27
 - 24
 - 36
 - 39
- In the reaction between $Co_2(CO)_8$ and $CH \equiv CH$, acetylene act as
 - four electron donor
 - two electron donor
 - one electron donor
 - five electron donor
- Ferrocene cannot undergo which of the following reaction?
 - Friedal craft acylation
 - Diels-Alder reaction
 - Oxidation by Ag^+ ions
 - Electrophilic substitution
- The pH of normal blood is
 - 5
 - 5.5
 - 6.5
 - 7.5

10. The oxidation state of iron in myoglobin is

- a) Fe (II), high spin
- b) Fe (II), low spin
- c) Fe (III), high spin
- d) Fe (III), low spin

PART- B

ANSWER ALL THE QUESTIONS

(5X7=35)

11. a) Discuss the structure and bonding in carboranes.

(OR)

b) What are metal clusters? How they are classified? Explain the preparation, structure and bonding in $[\text{Mo}_2\text{Cl}_8]^{2-}$

12. a) What is Wilkinson's catalyst? Explain the mechanism of Wilkinson's catalyst in the olefin hydrogenation

(OR)

b) Explain the hydroformylation of alkene.

13. a) Discuss the nucleophilic attack of co-ordinated ligands

(OR)

b) Explain the synthesis of Alkylidyne complexes.

14. a) How Ziese's salt is prepared? Explain the structure and bonding of Ziese's salt.

(OR)

b) Discuss the synthesis of Alkyne complexes.

15. a) Explain the active site structure and functions of ferredoxins and cytochromes.

(OR)

b) Write a note on Blue copper proteins.

PART-C

ANSWER ANY THREE QUESTIONS

(3X10=30)

16. a) Explain the bonding and structure of diborane.

b) Write a short note on silicones and phosphazenes.

17. a) Explain the following with mechanism

(i) Wacker process

(ii) Ziegler – Natta polymerization

b) Write a note on Oxidative addition reaction.

18. Explain the synthesis and bonding of alkylidene complexes in low and high oxidation states.

19. Discuss the bonding in π – metal olefin and π – metal acetylene complexes

20. Briefly explain the Heme proteins.