



UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Eighth Semester – 2020

Paper: Inorganic Chemistry (Sp. Theory -II)

Course Code: CHEM-426 Part – I (Compulsory)

Time: 15 Min. Marks: 10

Roll No. in Fig.

Roll No. in Words.

Signature of Supdt.:

ATTEMPT THIS PAPER ON THIS QUESTION SHEET ONLY.

Division of marks is given in front of each question.

This Paper will be collected back after expiry of time limit mentioned above.

Q.1. Encircle the correct option.

(10x1=10)

1. π -bonding is not involved in:

- a. Ferrocene
- b. Dibenzene Chromium
- c. Zeise's salt
- d. Grignard's reagent

2. What is the oxidation state of molybdenum in $[\eta^7\text{-tropylium})\text{Mo}(\text{CO})_3]^+$?

- a. +2
- b. +1
- c. 0
- d. -1

3. If complex $[\text{W}(\text{Cp})_2(\text{CO})_2]$ follows 18e- rule. What is Hapticity of Cp?

- a. 5 and 5
- b. 3 and 5
- c. 3 and 3
- d. 1 and 5

4. Which of the following is the incorrect statement about Zeise's salt?

- a. Zeise's salt is diamagnetic
- b. Oxidation state of Pt in Zeise's salt is +2.
- c. All the Pt-Cl bond length in Zeise's salt are equal
- d. C-C bond length of ethylene moiety in Zeise's salt longer than that of free ethylene

5. Biological functions of cytochrome and myoglobin are, respectively:

- a. Oxidation and O_2 storage
- b. O_2 transport and O_2 storage
- c. O_2 storage and electron carrier
- d. Electron carrier and O_2 transport

6. The reduction of nitrogen to ammonia, carried out by the enzyme nitrogenase, needs:

- a. 2 electrons
- b. 4 electrons
- c. 6 electrons
- d. 8 electrons

7. Among the following, the group that is bound to the metal ion in coenzyme B_{12} is:

- a. Methyl
- b. Cyanide
- c. Adenosyl
- d. Hydroxyl

8. The evidence of fluxionality can be studied by:

- a. FTIR
- b. UV/Vis
- c. NMR
- d. MS

9. Bond distance between Fe and N in heme, estimated by Perutz must be:

- a. 218 pm
- b. 110 pm
- c. 17 pm
- d. 200 pm

10. Siderosis can be cured by :

- a. Chelate therapy
- b. Antibiotics
- c. Antimalarial drug
- d. Ozone therapy



ATTEMPT THIS (SUBJECTIVE) ON THE SEPARATE ANSWER SHEET PROVIDED

Q.2. Give short answers to the following questions. (10x2=20)

- (i) Explain S_N1CB mechanism with an example.
- (ii) Compare myoglobin and hemoglobin with each other.
- (iii) What is differences between associative and dissociative mechanism.
- (iv) Give suitable examples for preparation of organometallic compounds from Grignard reagent.
- (v) Explain oxidative addition reactions with suitable example.
- (vi) Explain mechanism of Wacker's process?
- (vii) NMR justifies fluxional behavior. Explain it with a suitable example.
- (viii) Catecholate readily undergoes oxidation. Justify with suitable examples.
- (ix) Compare inert and labile complexes with each other.
- (x) How organometallic compounds are important in medical field?

Q.3. Answers to the following questions. (3x10=30)

- (i) What do you understand by term redox reactions? Explain the mechanism for bridged activated complexes.
- (ii) Write brief note on following:
 - (a) Hydroformylation process
 - (b) Reductive elimination reactions
- (iii) Discuss
 - a) structure and biological functioning of Vitamin B_{12} .
 - b) how nitrogenase enzyme is involved in *in vivo* nitrogen fixation.