

**17P316**

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Name: .....

Reg. No.....

**THIRD SEMESTER M.Sc. DEGREE EXAMINATION, NOVEMBER 2018**

(Regular/Supplementary/Improvement)

(CUCSS - PG)

**CC15P CH3 C10 - ORGANOMETALLIC AND BIOINORGANIC CHEMISTRY**

(Chemistry)

(2015 Admission onwards)

Time : Three Hours

Maximum : 36 Weightage

**Part A**

Answer *all* questions. Each question carries 1 weightage.

1. Explain fluxional behavior of organometallic compounds.
2. What are Zintl ions? Give examples?
3. Write a note on role of peroxidase.
4. Discuss hapticities possible for allyl system.
5. Explain the rate of hydroformylation reaction with respect to increasing reactant pressure.
6. Comment on the isolobal analogy of metal cluster.
7. Why water is used as universal solvent for biological medium?
8. Citing examples, differentiate between metalloenzymes and metal activated enzymes.
9. Explain 18-electron rule for organometallic compounds and give example for a metal carbonyl obeying this rule.
10. What is meant by 'Bohr effect'?
11. Explain Chevral phase with example.
12. Draw the coordination site of a bio-inorganic, organometallic compound existing in nature.

**(12 x 1=12 Weightage)**

**Part B**

Answer any *eight* questions. Each question carries 2 weightage.

13. Write a note on coenzyme B<sub>12</sub> effect.
14. How can you distinguish linear and bent metal nitrosyl using spectroscopy?
15. What is olefin metathesis, explain?
16. Explain Zeigler-Natta polymerization.
17. Explain the structure and functions of (Cu, Zn) SOD.

18. 'Manganese plays a vital role in the production of O<sub>2</sub> in photosynthetic pathway' , justify the statement.
19. Write a note on classification of carbenes and outline their synthesis.
20. Discuss the catalytic cycle of Monsanto acetic acid process.
21. Highlight any two points of differences and similarities among Haemoglobin, Hemerythrin and Hemocyanin.
22. Describe the structure and bonding in Zeise's salt.
23. Calculate the number of M-M bonds in
  - a) Fe<sub>3</sub>(CO)<sub>12</sub>
  - b) Mn<sub>2</sub>(CO)<sub>10</sub>
  - c) Os<sub>6</sub>(CO)<sub>18</sub>
24. Write a note on quadruple bonded non-carbonyl clusters and their structure with a suitable example.

**(8 x 2 = 16 Weightage)**

### **Part C**

Answer any *two* questions. Each question carries 4 weightage.

25. Discuss Oxygen transport by heme proteins- Haemoglobin and Myoglobin with special reference to pH dependence and cooperativity.
26. Explain catalytic cycle associated with Wacker's process and explain the role of co-catalyst system.
27. a) Explain the role of transferrin and ferritin in iron metabolism and transport.  
b) Write a note on structure and functioning of carboxypeptidase.
28. How is Ferrocene synthesized? Explain its bonding, structure and reactivity.

**(2 x 4 = 8 Weightage)**

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