

18P316

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Name.....

Reg. No.....

THIRD SEMESTER M.Sc. DEGREE EXAMINATION, NOVEMBER 2019

(Regular/Supplementary/Improvement)

(CUCSS-PG)

(Chemistry)

CC15P CH3 C10 - ORGANOMETALLIC AND BIOINORGANIC CHEMISTRY

(2015 Admission onwards)

Time: Three Hours

Maximum: 36 Weightage

Part A

Answer *all* questions. Each question carries 1 weightage

1. Write a note on role of catalases.
2. Discuss hapticities possible for butadiene system.
3. Using Wade-Mingo's-Lauher rule comment on the structure of $[\text{Re}_4(\text{CO})_{12}]^{2-}$
4. Differentiate between metalloenzymes and metal activated enzymes.
5. Comment on the significance of co-catalyst system in wacker process.
6. What is meant by 'Co-operativity in oxygen binding'?
7. Write a note on Chevral phase.
8. Write a note on properties of Schrock carbenes.
9. Calculate the number of M-M bonds in
 - a) $\text{Mn}_2(\text{CO})_{10}$
 - b) $\text{Os}_6(\text{CO})_{18}$
10. Highlight differences and similarities among Haemoglobin and Hemocyanin.
11. Discuss the detoxification role of cytochrome P-450 in human body.
12. Write a note on model system present in nitrogenases.

(12 x 1 = 12 Weightage)

Part B

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

13. Write a note on ionophores and their classification.
14. Discuss the significance of coenzyme B₁₂.
15. Explain the role of metalloenzymes in iron metabolism and transport.
16. How can you distinguish linear and bent metal nitrosyl using spectroscopy?
17. Explain Monsanto acetic acid process.
18. Discuss Fischer-Tropsch process?
19. Explain the structure and functions of Superoxide dismutase.

20. Explain quadruple bonding in metal clusters and discuss their structure with a suitable example.
21. Discuss olefin metathesis with respect to industrial perspective.
22. Write a note on sodium–potassium pump.
23. Explain the structure and role of Hemocyanin. How does it differ from heme proteins?
24. Discuss the structure and bonding in ethylene complexes.

(8 x 2 = 16 Weightage)

Part C

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

25. Explain the use of spectroscopy in study of bonding in metal carbonyls and metal nitrosyls.
26. Discuss the role of heme proteins-Haemoglobin and Myoglobin in oxygen transport and storage.
27. a) Write a note on role of Peroxidases and catalases.
b) Explain catalytic cycle associated with Wacker's process.
28. a) How is Ferrocene synthesized? Discuss its bonding, structure and reactivity.
b) Write a brief note on carbenes, discuss their synthesis and bonding.

(2 x 4 = 8 Weightage)
