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D 90978 (Pages : 2) Name.....

Reg. No.....

THIRD SEMESTER M.A./M.Sc./M.Com. DEGREE (REGULAR) EXAMINATION NOVEMBER 2020

(CBCSS)

Chemistry

CHE 3C 10—ORGANOMETALLIC AND BIO-INORGANIC CHEMISTRY

(2019 Admissions)

Time : Three Hours Maximum : 30 Weightage

Section A

Answer at least **six** *questions.*
Each question carries 1 *weightage.*
All questions can be attended.
Overall Ceiling 6.

1. What do you mean by agostic interaction ? Illustrate with an example.
2. Distinguish between cabene and carbyne organometallics.
3. Draw the possible structures of $Cp_2Fe_2(CO)_4$.
4. Which is more basic ; aniline or ferrocene ? Substantiate your answer.
5. Explain the role of a co-catalyst in Wacker process.
6. What are 'naked clusters' ? Give two examples.
7. What are isolobal fragments ? Explain with an example.
8. Hemocyanin is colourless, but in the oxy form it is coloured ; why ?
9. How does nature protect iron (II) in hemoglobin from its irreversible oxidation in presence of oxygen ?
10. How does vanadate ion interfere with $Na^+ - K^+$ pump in biological system ?

($6 \times 1 = 6$ weightage)

Section B

Answer at least **four** *questions.*
Each question carries 3 *weightage.*
All questions can be attended.
Overall Ceiling 12.

11. How is Zeise's salt synthesized ? Account for the changes in olefinic bond on forming this compound.
12. Discuss the structure and bonding in metal carbonyls.

Turn over

13. What is Collman's reagent ? Give any *two* of its synthetic applications.

14. Write a note on Chevrel phases.

15. Explain the structure and functions of hemerythrin.

16. Differentiate between metalloenzymes and metal activated enzymes, giving examples.

17. Discuss the structure and functions of catalase and peroxidase.

18. Explain the changes that generally occur in a ligand system when it gets co-ordinated t
ion.

(4 × 3 = 12 w

Section C

Answer at least **two** *questions.*
Each question carries 6 *weightage.*
All questions can be attended.
Overall Ceiling 12.

19. How metal nitrosyls are prepared ? Give an account of the structure and bonding in met
complexes. How linear and bent metal nitrosyls can be distinguished by using IR spect

20. What are the pre-requisities for the formation of metal -metal bonds ? Discuss the stru
bonding in $[Re_2Cl_8]^{2-}$.

21. Describe the photosynthetic process in plants bringing out the functions of PS-I and PS
do you mean by 'red-drop' in photosynthesis ?

22. Write notes on :

    (a) Role of calcium in blood clotting.

    (b) Siderophores.

    (c) Fullerene complexes.

(2 × 6 = 12 we