Reg. No. : ....

Name : ....

III Semester M.Sc. Degree (C.B.C.S.S.– OBE-Regular) Examination, October 2024
(2023 Admission)
CHEMISTRY/CHEMISTRY WITH DRUG CHEMISTRY SPECIALIZATION
MSCHD03C12/MSCHE03C12 : Inorganic Chemistry – III

Time : 3 Hours   Max. Marks : 60

SECTION – A

Answer **any 5** questions. Short answer questions. **Each** question carries **3** marks.

1. Cobalt does not form a mononuclear metal carbonyl, but forms $CO_2(CO)_8$. Give reasons. Draw the structure of $CO_2(CO)_8$.

2. Which will form complexes more readily, lanthanides or actinides ? Justify.

3. What is meant by hapticity of a ligand ? What are the possible hapticities for benzene ? Sketch the interactions.

4. What is ferritin ? Explain its functions.

5. What is Wilkinson's catalyst ? What are the advantages and disadvantages of Wilkinson's catalyst ?

6. Explain cooperativity in haemoglobin.   **(5×3=15)**

SECTION – B

Answer **any 3** questions. Paragraph questions. **Each** question carries **6** marks.

7. Discuss Wade Mingo's rules. Explain the structure of $[Os_5C(CO)_{15}]$ using Wade Mingo's rules.

8. Write a note on transactinide elements.

9. Describe the catalytic cycle and the reactions involved in Wacker process. Explain the role of co-catalyst in Wacker process.

10. Explain Tolman cone angle and Tolman electronic parameter in the case of phosphine ligands.

11. Discuss the structure and functions of cytochrome P450. **(3×6=18)**

SECTION – C

Answer **any 3** questions. Essay type questions. **Each** carries **9** marks.

12. Discuss the structure and bonding in $[Re_2Cl_8]^{2-}$ on the basis of MOT.

13. Discuss Ellingham diagram, its important characteristics, applications and limitations in metallurgical processes.

14. Explain the synthesis, structure and reactivity of Fischer and Schrock carbenes.

15. Describe the mechanism involved in oxidative addition, reductive elimination and insertion reactions of organometallic compounds. Explain with appropriate equations.

16. Explain PS-I and PS-II in photosynthetic process in plants. Explain the term '*red-drop*' in photosynthesis. **(3×9=27)**

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