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W – 5309

Reg. No. :

Name :

Third Semester M.Sc. Degree Examination, December 2025
Chemistry/Analytical Chemistry/Polymer Chemistry/Chemistry with
Specialisation in Drug Design and Development
CH 231/CL 231/PC 231/CHDD 531 : INORGANIC CHEMISTRY III
(2020 Admission Onwards)

Time : 3 Hours

Max. Marks : 75

SECTION – A

Answer **any two** sub-questions among (a), (b), or (c) from each question. Each sub-question carries **2** marks.

1. (a) What is meant by oxidative addition? Give an example.
(b) Discuss the bonding in metal carbonyls.
(c) What are the limitations of ziegler-Natta catalyst?
2. (a) How does chelate effect affect the stability of complexes?
(b) What are the applications of the trans effect?
(c) What is the mechanism of photo isomerization reaction of metal complexes?
3. (a) What are the functions of biological membranes?
(b) What is the synthetic model for photosynthesis?
(c) What is the function of hemoglobin?
4. (a) Discuss the IR spectra of complexes with water and ammonia as ligands.
(b) Discuss the CD spectra of iron complexes.
(c) Discuss the use of ^{11}B -NMR Spectra in the study of metal nuclides.
5. (a) What is the significance of magic numbers?
(b) What is half-life? How is it differing from average life?
(c) What is the principle of cloud chamber?

(10 × 2 = 20 Marks)

P.T.O.

SECTION – B

Answer either (a) or (b) of each question. **Each** question carries **5** marks.

6. (a) Explain the Wacker process.
(b) Explain the structure and bonding of ferrocene complex.
7. (a) Describe the kinetics and mechanism of octahedral substitution reaction.
(b) Illustrate the spectroscopic method for the determination of the stability constant of a complex.
8. (a) Explain the mechanism of ion transport across membranes.
(b) What is Photosystem I? How is it differing from photosystem II?
9. (a) Explain the ORD spectra of Chromium metal complexes.
(b) Discuss the ESR spectrum of BH_3 radical.
10. (a) Discuss the principle and working of a Breeder reactor.
(b) Briefly explain the photonuclear reactions.

(5 × 5 = 25 Marks)

SECTION – C

Answer **any three** questions. Each question carries **10** marks.

11. Explain the Hapto nomenclature of organometallic compounds.
12. Explain the Outer sphere mechanism of electron transfer reactions.
13. (a) Discuss the structure and functions of carboxypeptidase A.
(b) Discuss the toxic effects of lead compounds.
14. What is the principle of Mossbauer spectroscopy? Explain how it is useful in the study of iron complex.
15. Explain the Shell Nuclear model.

(3 × 10 = 30 Marks)
