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**U – 6236**

**Reg. No. :** .....

**Name :** .....

**Third Semester M.Sc. Degree Examination, March 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 16 electron rule?

(b) What are the conditions for reductive elimination?

(c) What are the different types of elimination reactions?
2. (a) Discuss the synthetic applications of trans effect theory.

(b) What are racemisation reactions?

(c) Discuss the photoaquation reaction of metal complexes.
3. (a) What are the importances of sodium potassium pump?

(b) What are the functions of Myoglobin?

(c) Discuss the toxic effects of lead.

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4. (a) How will you distinguish between CO and NO using IR spectroscopy?  
(b) What does an ORD spectrum tell you?  
(c) Discuss the principle of Mossbauer spectroscopy.
5. (a) What are the significance of the Magic Numbers?  
(b) What are the disadvantages of breeder reactors?  
(c) What is the principle of Geiger–Müller counter?

**(10 × 2 = 20 Marks)**

SECTION – B

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

6. (a) Describe the structure and bonding of polynuclear carbonyls.  
(b) Illustrate the structure and bonding of cyclopentadienyl metal complexes.
7. (a) Explain the mechanism of ligand substitution reactions in square planar complexes.  
(b) Explain the inner sphere mechanism of electron transfer.
8. (a) Describe the structure and functions of biological membranes.  
(b) Discuss the structure and functions of cytochrome P 450.
9. (a) Discuss the applications of ESR spectroscopy to Copper (II) complexes.  
(b) Discuss the applications of Mossbauer spectroscopy.
10. (a) Explain the liquid drop model of the nucleus. What are its limitations?  
(b) Discuss the difference between proportional chamber and cloud chamber.

**(5 × 5 = 25 Marks)**

## SECTION – C

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

11. Explain the Monsanto acetic acid process.
12. (a) What is the significances of stability constant of metal complexes? Discuss the determination of stability constant of metal complexes by potentiometric method.  
  
(b) Explain the dissociative mechanism in octahedral substitution reactions.
13. Explain the structure and functions of ferritin and transferrin.
14. Explain the NMR spectroscopy of  $^{31}\text{P}$ . What are the applications of  $^{31}\text{P}$ -NMR spectroscopy?
15. Explain the various types of nuclear reactions.

**(3 × 10 = 30 Marks)**

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