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**(FOR THE CANDIDATES ADMITTED DURING THE ACADEMIC YEAR 2022-23 ONLY)**

**SUB CODE 22 PCY 204**

**REG.NO.**

**N.G.M.COLLEGE (AUTONOMOUS) : POLLACHI**

**END-OF-SEMESTER EXAMINATIONS : MAY – 2023**

**M.Sc. – CHEMISTRY** **MAXIMUM MARKS: 50**

**II SEMESTER** **TIME : 3 HOURS**

## INORGANIC CHEMISTRY-II : COORDINATION CHEMISTRY

### SECTION – A (10 X 1 = 10 MARKS)

**ANSWER THE FOLLOWING QUESTIONS. (K1)**

1. According to Werner how many valencies showed by the central metal ion in coordination complexes?

   a) Two types b) Three types c) Four types d) Five types

2. Atomic number of Nickel is _____.

   a) 27 b) 28 c) 29 d) 3 0

3. Ligands are always _____.

   a) Accept lone pair of electrons b) Donate lone pair of electrons
   c) Neither accept and nor donate d) Both a and b correct

4. For the formation of inner orbital complex, ligand must be _____.

   a) Negatively charged b) Neutral c) Weak d) Strong

5. Most of the cyclotriphosphazenes have _____.

   a) Chain form structure b) Puckered structure
   c) Tetrahedral structure d) Planar structure

**ANSWER THE FOLLOWING IN ONE (OR) TWO SENTENCES. (K2)**

6. What is coordination chemistry?
7. Define: Quantum number of multi electron atom.
8. What are mixed valent complexes?
9. Write a note on complexes with coordination number two.
10. Define: Inorganic chains.

### SECTION – B (5 X 3 = 15 MARKS)

**ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS. (K3)**

11. a) Write a note on valence bond theory

(OR)

b) Explain Jahn-Teller distortion and its applications.

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12. a) Write a note on Hund's rule in determination of low energy state

(OR)

b) Give an account of electronic spectra of coordination compounds

13. a) Explain trans effect with suitable example.

(OR)

b) Discuss the rate law for nucleophilic substitution in a square planar complex

14. a) Write a note on complexes with coordination number four

(OR)

b) Give an account of site preference in trigonal bipyramidal complexes

15. a) Write a note on cages and clusters

(OR)

b) What are heteropoly anions?

**SECTION – C (5 X 5 = 25 MARKS)**

**ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS. (K4 /K5)**

16. a) Write a note on $\alpha$ orbital soliting using crystal field theory.

(OR)

b) Explain crystal field stabilisation energy.

17. a) Explain temperature independent Paramagnetism.

(OR)

b) Give an account of spin cross over phenomena.

18. a) Discuss theories of trans effect.

(OR)

b) Write a note on kinetics of octahedral substitution.

19. a) Explain geometrical isomerism in octahedral complexes.

(OR)

b) Write a note on isomerism in five coordinate complexes.

20. a) Give an account of catenation and heterocatenation.

(OR)

b) Write a note on phosphazene polymers.

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ETHICAL PAPER