

FACULTY OF SCIENCE

M.Sc. II-Semester Examination, May / June 2018

Subject : Chemistry

Paper - I

Inorganic Chemistry

Time : 3 hours

Max. Marks : 80

Note : Answer all questions from Part-A and Part-B. Each question carries 8 marks in Part-A and 12 marks in Part-B.

PART – A (4 x 8 = 32 Marks)
(Short Answer Type)

- 1 a) Explain conjugate base mechanism with example.
b) Write the differences between SE and SN reactions.
- 2 a) Write notes on hole formalism.
b) Explain j-j coupling scheme.
- 3 a) Write classification of metal clusters. Give examples.
b) Discuss metal carbonyl scrambling.
- 4 a) Write notes on Vitamin B₆.
b) Write briefly on hemocyanin.

PART – B (4 x 12 = 48 Marks)
(Essay Answer Type)

- 5 a) Enumerate the factors affecting base hydrolysis.
b) What is trans effect? Explain Grienberg's polarization theory.
OR
c) Explain Associative and Dissociative mechanism in ligand substitution reactions.
d) Discuss the substitution reactions without M-L bond cleave.
- 6 a) Explain Orgel diagrams for high spin d^2 and d^8 octahedral and tetrahedral complexes.
b) What is spin-orbit coupling? Derive ground term symbol for carbon.
OR
c) Derive term symbols for d^2 configuration.
d) Write notes on Racah parameters.
- 7 a) Discuss total electron count theory. How structure of clusters are predicted using TEC method.
b) Write structures of Os₆, Os₇ and Os₁₀ clusters.

OR

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- c) Write notes on tetranuclear carbonyl clusters.
 - d) Discuss structural features of dinuclear halide clusters.
- 8 a) Write photosynthetic mechanism in green plants.
b) Write notes on i) transamination and ii) decarboxylation reactions.
- OR**
- c) Write notes on allosteric models for hemoglobin.
 - d) Discuss the role of essential trace metals in biological systems.

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