

PARUL UNIVERSITY
FACULTY OF APPLIED SCIENCE
M.Sc., Winter 2017-18 Examination

Semester: 1
Subject Code: 11205102
Subject Name: Inorganic Chemistry-I

Date: 20/12/2017
Time: 02:00pm to 04:30pm
Total Marks: 60

Instructions:

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

- Q.1. A) Write a Brief note on followings: (08)**
- (a) Explain M.O. diagram for NO molecule. Calculate Bond order and discuss its magnetic Property.
 - (b) Describe the symmetry composition, hybridization of orbitals and formation of AB₂ and AB₃ types of molecules. (Diagrams are necessary).
- Q.1. B) Answer the following questions (Any two) (04)**
- (a) Short questions:
 1. Define Bond order and Bond-length.
 2. Explain Resonance concept with one example.
 - (b). Describe the important applications of Metal Clusters. (04)
 - (c). Mention the main postulates of VSEPR Theory and explain structure of Methane. (04)
- Q.2. A) Answer the following questions. (04)**
- (a) Short questions.
 1. Differentiate MOT and VBT. (Three points each)
 2. What are Metal clusters? Give their examples.
 - (b) Write a short note on Isolobal analogies with examples. (04)
- Q.2. B) Answer the following questions (Any two) (03)**
- (a) Describe the Molecular orbital Interpretations of H₂. (03)
 - (b) Give the synthesis and properties of Any of Metal Carbonyl Compounds. (03)
 - (c) Write a note on Pauling-Slater's concept. (03)
- Q.3. A) Explain in detail. (08)**
- (a). Give the synthesis, structure and applications of Organoboron compounds.
 - (b). Describe the structures properties of Linear and Cyclic Borazenes.
- Q.3. B) Answer the following questions (Any two) (04)**
- (a) Short questions:
 1. Give the structure and preparation of Inorganic benzene.
 2. Define Metal complex. Why they produce colour?
 - (b) Describe the preparation, structure of Phosphazenes. (04)
 - (c) Give the synthesis and uses of Organosilicon compounds. (04)
- Q.4. A) Answer the following questions. (04)**
- (a) Short questions:
 1. Give the reason for the splitting of d-orbitals. Give one example of splitting.
 2. Mention the main points of MOT of complex compounds.
 - (b) Describe the d-d Splitting in Octahedral complex. (04)
- Q.4. B) Answer the following questions (Any two) (03)**
- (a) Explain: Nephelauxetic series. (03)
 - (b) Describe the d-d Splitting in Tetragonal complex. (03)
 - (c) Give the synthesis and structures of Phosphonitrilic polymers. (03)