8. (a) What are Zintl ions and Chevrel phases ? Discuss their structures. **10**

(b) Sketch with comments on the structure of the following using Wade's rule : **5,5**

(i) $Fe_2(CO)_9$

(ii) $Fe_3(CO)_{12}$

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DD-292

M. Sc. EXAMINATION, Dec. 2017

(Fourth Semester)

(Re-appear Only)

CHEMISTRY

CH-604-B

Inorganic Special-V (Inorganic Solids, Polymer and Cluster Compounds)

Time : 3 *Hours*] [*Maximum Marks :* 100

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit. All questions carry equal marks.

Unit I

1. (a) Discuss the following structures with diagrams : **7,7**

(i) Rutile structure

(ii) Nickel arsenide structure.

(b) Explain the packing of the constituents particles in fcc and bcc structures. **6**

2. (a) Explain spinels with structure. **10**

(b) Describe the types of close packing of identical solid spheres. **10**

Unit II

3. Explain both powder and single crystal methods in XRD. **20**

4. (a) Describe band theory of solids taking examples of Li and Be Both. **10**

(b) Also explain neutrons and electrons diffraction. **10**

Unit III

5. What are inorganic polymers ? Discuss their general properties ? What is glass temperature of polymers ? Why is it so called ? **20**

6. (a) Discuss the synthesis and structures of some inorganic polymers of : **5,5**

(i) chelating agents

(ii) cyclopentadienyl rings.

(b) Discuss the synthesis and structure of inorganic polymers based on sulphur. **10**

Unit IV

7. For the following molecules, give the formal oxidation state of the metal, d electron count, total valence electrons, the number of M-M bonds and draw the possible structure of :

(i) $Co_4(CO)_{12}$

(ii) $Mn_2(CO)_{10}$

(iii) $Fe_3(CO)_{12}$ **7,7,6**