

Reg. No. :

Name :

Second Semester M.Sc. Degree Examination, July 2019

Branch : Chemistry/Polymer Chemistry

CH/CL/CM/CA/PC 221 : INORGANIC CHEMISTRY – II

(Common for Chemistry (2016 Admission Onwards) and Polymer Chemistry (2018 Admission))

Time : 3 Hours

Max. Marks : 75

SECTION – A

Answer any **two** among (a), (b) and (c) from each question: Each sub-question carries **2** marks

- What is Polythiazyl? Give its preparation and structure.
 - What is inorganic graphite? Discuss its preparation and uses.
 - How is diborane prepared? Give its structure.
- What are term symbols? Derive the term symbols for d^4 and d^8 ions.
 - Why is $[\text{Mn}(\text{H}_2\text{O}_6)]^{2+}$ faintly coloured?
 - The magnetic moments of $[\text{Ni}(\text{CN})_4]^{2-}$ and $[\text{Ni}(\text{C}_1)_4]^{2-}$ are zero and 4.2BM, respectively. Why?
- Define (i) unit cell and (ii) space lattice.
 - When does a crystal said to possess a rotation-inversion axis?
 - Define imperfections in crystals. What is atomic imperfection?



4. (a) Correlate the occurrence of +2 and +4 oxidation states of lanthanides with their electronic configurations.
- (b) Lighter actinide ions exhibit broadening of absorption peaks somewhat like the broadening found in transition metal ions. Why?
- (c) What is sillimanite? What are its composition and use?
5. (a) What are k space and Brillouin zones?
- (b) Explain doping with an example.
- (c) What is photovaltic effect? Mention its applications.

(10 × 2 = 20 Marks)

SECTION – B

Answer either (a) or (b) of each question, and each question carriers 5 marks.

6. (a) Give one method each for the preparation of P_4S_3 and P_4S_{10} . Discuss their structures and uses.
- (b) State Wade's rules and discuss with examples.
7. (a) What are charge-transfer transitions? Discuss their types and characteristics.
- (b) What do you mean by orbital contribution and quenching of orbital angular moments? In which cases do you expect quenching? Explain with examples.
8. (a) Using suitable examples, explain different close packed structures such as, BCC, FCC and HCP.
- (b) How are colour centers formed? Discuss their characteristics.
9. (a) What is lanthanide contraction? Discuss its consequences.
- (b) What are trans-uranium elements? Comment on their stabilities. What are their uses?

