Reg. No. : ....

Name : ....

First Semester M.Sc. Degree Examination, February 2019
Branch : Chemistry/Polymer Chemistry
CH/CL/CM/CA/PC 211 : INORGANIC CHEMISTRY – I
(Common for Chemistry (2016 Admission Onwards) and Polymer Chemistry (2018 Admission)

Time : 3 Hours

Max. Marks : 75

SECTION – A

Answer **two** among (**a**), (**b**) and (**c**) from **each** question carries **2** marks.

1. a) Calculate the CSFE of a d^4 system in strong octahedral field.

   b) State Jahn-Teller Theorem.

   c) Tetragonal distortion is exhibited by

      i) d^0 ii) d^5 iii) d^9 iv) d^3 system

2. a) Explain the terms i) Standard deviation ii) Average deviation.

   b) What is redox reaction ? Give examples.

   c) Evaluate the following expressions rounding off the answer to the appropriate number of significant figures i) 42.71 g + 9.643 g + 8.0 g ii) 0.165 m^3 kg + 10.487 m^{-3} kg.

3. a) What is meant by character table ?

   b) What is the basis for irreducible representations ?

   c) Assign the point group to the following molecules
     i) Forrocene (staggered)
     ii) Naphthalene.

4. a) Discuss the position of Noble gases in periodic table.

   b) Complete the following reactions

      i) $XeF_2 + 2H_2 \rightarrow$

      ii) $XeF_2 + 2SO_3 \rightarrow$

   c) Explain the term of shape selectivity.

5. a) What is a smog ?

   b) What are green house gases ?

   c) What is the effect of ozone depletion ?   **(2×10=20 Marks)**

SECTION – B

Answer **either** among (**a**) or (**b**) from **each** question carries **5** marks.

6. a) Explain Crystal Field Stabilization Energy (CSFE). How it vary with ligand field strength ?

   b) What are the type of pi bonding ? Discuss the pi bonding in complexes.

7. a) Explain the difference between

      i) Accuracy-Precision

      ii) Determinate-Indeterminate errors.

   b) What is a complexometric titrations ? Name some important polydentate complexometric titrations.

8. a) Explain Great Orthogonally Theorem.

   b) Construct the character table for C_2V point group.

9. a) Write short notes on silicones.

   b) Discuss the preparation and properties of Xenon fluorides.

10. a) Give the composition of air.

    b) Give the significance of BOD and COD.   **(5×5=25 Marks)**

SECTION – C

Answer **any three** questions. **Each** question carries **10** marks.

11. Construct the M.O. diagram of an octahedral complex using sigma bonding. Calculate its bond order.

12. Explain the different types of errors and how it will be minimized.

13. Discuss the construction of character table C_3V point group.

14. Briefly explain the preparation, properties and applications of isopoly and heteropoly acids of Mo and W.

15. Explain the chemistry of soil.   **(3×10=30 Marks)**

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