

Reg. No. :

Name :

First Semester M.Sc. Degree Examination, December 2019

Chemistry/Polymer Chemistry

CH/CL/CM/CA/PC 211: INORGANIC CHEMISTRY I

(Common for Chemistry (2016 Admission Onwards) and

Polymer Chemistry(2018 Admission Onwards)

Time : 3 Hours

Max. Marks : 75

SECTION – A

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

1. (a) According to CFT, in a tetrahedral complex 'e' orbitals of a metal lies below t_2 orbitals. Give reason.
(b) Comment on the structure and stereoisomerism exhibited by (meso-stilbenediamine) (isobutylenediamine)Pt(II)Chloride.
(c) Distinguish between a amphidentate and macrocyclic ligands with examples.
2. (a) Distinguish between absolute error and relative error.
(b) Why alpha alumina is used as a reference material in DTA?
(c) Explain the back titration method of EDTA titration.
3. (a) What are the differences between reducible and irreducible representations of a point group?
(b) Give the reduction formula and explain the terms involved in the expression.

P.T.O.



- (c) Determine the symmetry point groups of the following molecules:
- (i) S_8
 - (ii) N_2O_4
 - (iii) B_2H_6
 - (iv) NO_2^-
4. (a) What is the effect of pH with isopolyanions?
- (b) Identify the general class and chemical formula of the following silicate materials:
- (i) Ultramarine
 - (ii) Beryl
 - (iii) Talc
 - (iv) Asbestos
- (c) Give the method of preparation of KrF_2 . What is its reaction with A?
5. (a) Which pollutants are responsible for photochemical smog? Mention any two detrimental effects of photochemical smog.
- (b) Distinguish between COD and BOD.
- (c) What are the major pollutants present in the automobile exhaust?

SECTION – B

(Answer either (a) or (b) of each question. Each question carries 5 marks)

6. (a) Write a note on spectrochemical series.
- (b) Explain briefly the stereoisomerism exhibited by 4 and 6 coordinated complexes.
7. (a) Describe the working of an adsorption indicator.
- (b) Write a short note on organic precipitants used in gravimetry.



8. (a) Discuss the sigma hybridisation scheme of PCl_5 molecule.
(b) Write a short note on classification of elements of a group.
9. (a) What are zeolites? Mention two important applications of zeolites.
(b) What are the different types of inter halogen compounds? Discuss the structure of ClF_3 molecule.
10. (a) Discuss how DO of a water sample is measured and explain the significance of DO value.
(b) Briefly explain the cation exchange reactions in soil.

SECTION – C

(Answer any **three** questions and. Each question carries 10 marks)

11. Draw and explain the MO diagram for Cobalt (III) high spin octahedral complex with sigma bonding and discuss the salient features. Discuss the pi bonding effect on $10Dq$ values of octahedral complexes.
12. Describe the theory of acid base, redox and metallochromic indicators with suitable examples.
13. State and explain GOT. Prepare C_{3v} character table using GOT.
14. What are silicones? How are they classified? Mention the application of each class.
15. Explain the formation of ozone in the stratosphere. What is the importance of ozone layer? What are the causes for the depletion of ozone layer and consequences of ozone depletion?

