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Reg. No. : ....

Name : ....

First Semester M.Sc. Degree Examination, August 2021

Chemistry/Analytical Chemistry/Polymer Chemistry

CH/CL/PC 211: INORGANIC CHEMISTRY I

(2020 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.

1. (a) Define the terms constant error and proportionate errors?

   (b) What is a complexometric indicator? Give an example

   (c) What is meant by ageing of precipitate? Explain.

2. (a) Explain SOFC's?

   (b) What are Anti-stokes phosphors? Give two examples.

   (c) What are Fullerides? Mention its uses.

3. (a) What is nephelauxetic effect? How can it explain metal ligand covalency in metalcomplexes?

   (b) How do d-orbitals split in square planar crystal fields?

   (c) Explain thermodynamic and kinetic stability of complexes.

4. (a) Write one method for preparation of isopolyacid of Vanadium

   (b) Explain the application of zeolites as molecular sieves.

   (c) Give one method for preparation of polysiloxanes.

5. (a) Suggest a method to control acidity in soil.

   (b) Explain the catalytic role of Freons on ozone layer.

   (c) What is meant by ion speciation?

(10 × 2 = 20 Marks)

SECTION – B

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

6. (a) Define CFSE. Calculate CFSE for $[Mn(H_2O_6)_6]^{2+}$ and $[Cu(NH_3)_6]^{2+}$.

   (b) Explain Jahn-Teller theorem. Briefly discuss JT effect.

7. (a) Write a note on classification of errors into determinate and indeterminate.

   (b) Compare the method of averages and least squares for treatment of analytical data.

8. (a) Briefly the types of solid electrolytes.

   (b) Write a note on molecular magnets.

9. (a) What are the adverse effects of air pollutants on human

   (b) Write a note on exchange phase composition.

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10. (a) Write a note on structure of XeF_2.

    (b) How are silicones prepared? What are the reasons for their thermal stability and chemicalinertness?

(5 × 5 = 25 Marks)

SECTION – C

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

11. Explain molecular orbital theory of bonding in the complex $[Co(NH_3)_6]^{3+}$.

12. Write a note on preparation and properties of heteropoly acids of Mo and W.

13. Give a brief account of:

    (a) Photochemical smog and its role in ozone depletion.

    (b) Hydrologic cycle

14. Differentiate between co-precipitation and post-precipitation. How do they affect quantitative analysis? How they can be avoided? Describe the use of oxine as precipitant in gravimetry.

15. Write a note on Solid state chemistry of metal nitrides, fluorides and chalcogenides.

(3 × 10 = 30 Marks)

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