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Reg. No. : .....

Name : .....

First Semester M.Sc. Degree Examination, February 2019
Branch : CHEMISTRY
CL / CA / CM / CH 211 – Inorganic Chemistry – I
(2013 Admission – 2015 Admission)

Time : 3 Hours Max. Marks : 75

SECTION – A

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

1. a) Most of the Xe compounds are formed with F or O donor atom. Why ?
   b) Give the structures of BrF_5 and IF_7.
   c) What are zeolites ? What are their uses ?

2. a) Differentiate bidentate – and ambidentate ligands. Give suitable examples.
   b) Between $[Ag(en)]^+$ and $[Ag(NH_3)_2]^+$ which one is more stable ? Why ?
   c) Which of the ions, Mn(III), Fe(III) and Cr(III) would be considered as Jahn-Teller ions when located in an octahedral ligand field ? Why ?

3. a) What is correction coefficient ? Explain its importance.
   b) Which are the 4 different types of reactions involved in volumetric estimations ? Give one example for each.
   c) What is dimethylglyoxime ? Explain its use in gravimatric analysis.

4. a) What are fullerenes ? What made their discovery possible ?
   b) What are quantum size effects ? Explain.
   c) What is meant by writing with atom ? Explain.

5. a) Identify the major chemical species present in the atmosphere.
   b) What is hydrologic cycle ? Illustrate.
   c) Sketch the soil profile of Lithosphere. **(2×10=20 Marks)**

P.T.O.

SECTION – B

Answer either **a**) or **b**) of **each** question and **each** question carries **5** marks.

6. a) Give a short account of the chemistry of Astatine.
   b) Discuss the formation and structures of isopoly acids of M_o.

7. a) Discuss the factors affecting the stability of complexes.
   b) Illustrate the effects of crystal field splitting on lattice energy and hydration energy.

8. a) Discuss different types of errors. How are they minimised ?
   b) Write briefly on fluorescent – and chemiluminescent indicators.

9. a) Explain one method each for the synthesis of silver and platinum nanoparticles.
   b) What are gas phase clusters ? Give one method for their formation and detection.

10. a) Write a note on the structure and chemistry of the stratosphere.
    b) What are the unique properties of water ? Explain. **(5×5=25 Marks)**

SECTION – C

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

11. What are carbides ? How are they classified ? Discuss the structures, special properties and uses of SiC and B_4C.

12. a) Give a critical account on optical isomerism among coordination compounds.
    b) Write on spectrochemical – and nephelauxetic series so as to differentiate them.

13. Briefly describe the process involved in the formation of precipitate for gravimetric estimations. What are the effects of super saturation on the nature of the precipitate ? How can it be prevented ?

14. a) Write on carbon nanotubes – synthesis, properties and uses.
    b) Principle and application of SEM in the characterization of nanomaterials.

15. Write on :
    a) Automobile exhaust pollutants and their catalytic reduction.
    b) Acid-base – and ion-exchange reactions in soil. **(10×3=30 Marks)**

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