RDN – 17

B.Sc. (Semester – VI) Examination, April/May 2019
CHEMISTRY (6 Units) (Paper – II)
Inorganic Chemistry

Duration : 2 Hours

Total Marks : 80

Instructions *:1)* ***All*** *questions are* ***compulsory*** *however internal choice is available.*

2) Figures to the ***right*** *indicate maximum marks to the question.*

3) Answers to the ***two*** *Section should be written in* ***separate*** *answerbook.*

SECTION – I **40**

1. Answer **any four** of the following. **(4×4=16)**

   a) Describe symmetry element and symmetry operation with appropriate example.

   b) Explain with suitable example how geometry of a complex can be determined from the electronic spectra.

   c) What is 'green house effect' ? Explain how CO_2 in air contribute to green house effect.

   d) Give reason why $KMnO_4$ have an intense violet colour.

   e) Describe with an example different planes of symmetry.

   f) Explain manufacturing process of water gas.

2. A) Write short note on following rules for electronic transition.

      i) Laporte orbital selection rule.

      ii) Spin selection rule. **6**

      OR

   A) Describe charge transfer transition and intra ligand transition. **6**

   B) Write a descriptive note on control of NO_x pollution. **6**

P.T.O.

3. A) Explain the role of following in manufacturing of ammonia by Haber's process.
   i) Catalyst
   ii) Pressure of reacting gases. 6

   OR

   A) Write note on 'effect of pressure', in Ostwald's method of HNO_3 synthesis, during
   i) Oxidation of NH_3 to NO
   ii) Oxidation of NO to NO_2. 6

   B) i) Describe Rotation reflection axis in trans dichloroethelene : 3

   ii) Explain how NO_x can be reduced in power plant emission. 3

SECTION – II 40

4. Answer **any four** of the following. **(4×4=16)**

   a) Calculate the magnetic moment for spin-only motion (μ_s) of electron for
   1) Fe^{2+} (high spin) 2) Mn^{2+}

   b) Give the biomedical applications of zeolites.

   c) Explain the Meissner Effect of superconductivity.

   d) What are silicones ? Give the synthesis of a linear silicone.

   e) What is Trans Effect ? Design a route for the synthesis of cis and trans $[PtNH_3NO_2Cl_2]^-$ starting from $[PtCl_4]^{2-}$.

   f) Explain how the thermodynamic stability of complexes is affected by
   1) Size and charge of the metal ion
   2) Basicity of ligands .

5. a) i) What is Neel Temperature ? Explain the types of magnetic behaviours exhibited by materials below and above the Neel Temperature. 4

   ii) Define
   1) Superconductivity
   2) Superconducting transition temperature. 2

   OR

a) iii) Discuss briefly Guoy's method of determination of magnetic susceptibility. **4**

iv) What are conventional superconductors ? **2**

b) i) What are nanoparticles ? Explain the suitability of nanoscale MgO and CaO in ceramics. **4**

ii) Define an inorganic polymer. Give two examples. **2**

6. a) i) Classify and explain on the basis of Taube's classification the following metal ions as inert or labile :

1) $Ti^{3+}(d^1)$ 2) $Cr^{3+}(d^3)$

3) $Co^{3+}(d^6$ low spin) 4) $V^{2+}(d^3)$. **4**

ii) Distinguish between thermodynamic and kinetic stabilities of complexes. **2**

OR

a) iii) What are condensation polymers and addition polymers ? Give examples. **4**

iv) What are zeolites ? Give their general formula. **2**

b) i) Discuss the S_N1CB mechanism as observed in base hydrolysis reactions of cobaltammine complex. **4**

ii) Give two points of distinction between organic and inorganic polymers. **2**
