

**T.Y.B.SC. SEM – V (CBCS - 2016 Course) : SUMMER - 2019**  
**SUBJECT : CHEMISTRY INORGANIC CHEMISTRY – I**

Day : Friday  
Date : 12/04/2019

Time : 11.00 A.M. To 02.00 P.M.  
Max. Marks : 60

**S-2019-0863**

**N. B. :**

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Draw neat and labelled diagram **WHEREVER** necessary.
- 4) Use of non-programmable calculator and log table is **ALLOWED**.

**Q. 1** Attempt **ANY TWO** of the following: (12)

- a) Write the postulates of Crystal Field Theory?
- b) Write IUPAC Nomenclature for following compounds:
  - i)  $K_4[Fe(CN)_6]$
  - ii)  $[Co(NH_3)_4Cl_2]^+$
  - iii)  $[Cr(en)_3]Cl_3$
- c) Describe 'Differential Aeration Principle with respect to corrosion'.

**Q. 2** Attempt **ANY TWO** of the following: (12)

- a) Explain splitting of d-orbitals in a Tetrahedral complex on the basis of crystal field theory.
- b) What are limitations of Valence Bond Theory (VBT).
- c) Explain following types of isomerism with suitable examples:
  - i)  $[MA_4X_2]$  type
  - ii)  $[MA_3X_3]$  type

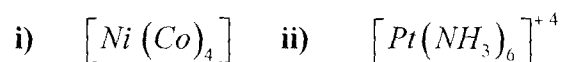
**Q. 3** Attempt **ANY TWO** of the following: (12)

- a) Discuss postulates of Werner's coordination theory.
- b) Define structural isomerism. Explain following types of isomers with suitable example:
  - i) Ligand isomerism
  - ii) Linkage isomerism
- c) Explain bonding and geometry in following complexes on the basis of VBT:
  - i)  $[MnCl_4]^{-2}$
  - ii)  $[Ni(CN)_4]^{-2}$

**P. T. O.**

**Q. 4** Attempt **ANY THREE** of the following: (12)

**a)** Explain whether Sidgwick's EAN rule is obeyed in the following complexes or not:



**b)** Calculate CFSE for following systems in weak octahedral field.



**c)** Explain how following factors affect corrosion?



**d)** Write limitations of Crystal Field Theory.

**Q. 5** Attempt **ANY FOUR** of the following: (12)

**a)** Draw and explain Primary and Secondary valences in  $CoCl_3 \cdot 5NH_3$  on the basis of Coordination chemistry.

**b)** Explain use of Inorganic coatings for the prevention of Corrosion.

**c)** Define following terms:

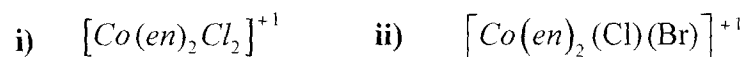
**i)** Coordination Compound

**ii)** Bidentate ligand

**iii)** Central metal ion

**d)** Calculate CFSE for  $d^6$  system in strong Octahedral field.

**e)** Write Cis-Trans isomers for following metal complexes:



**f)** Write any three postulates of VBT.

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