

**BACHELOR OF SCIENCE (CBCS - 2016 COURSE)**  
**T. Y. B Sc. Sem-V : WINTER :- 2021**  
**SUBJECT: CHEMISTRY : INORGANIC CHEMISTRY-I**

Day : Friday  
Date 21-01-2022

W-14940-2021

Time : 02:00 PM-05:00 PM  
Max. Marks: 60

**N.B.:**

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.

**Q.1** Attempt **ANY TWO** of the following: **[12]**

- a) Discuss the postulates of crystal field theory.
- b) What is corrosion? Explain atmospheric corrosion with example.
- c) Write IUPAC Nomenclature for following compounds:  
i)  $K_4 [Ni (CN)_4]$       ii)  $[Pt (NH_3)_2 Cl_4]$       iii)  $[Co (NH_3)_6] Cl_3$

**Q.2** Attempt **ANY TWO** of the following: **[12]**

- a) Explain following types of Geometrical isomers with suitable examples:  
i)  $[MA_4 X_2]$       ii)  $[MA_2 XY]$
- b) What are limitations of valence bond theory?
- c) Explain splitting of d-orbital in an Octahedral complex on the basis of crystal field theory.

**Q.3** Attempt **ANY TWO** of the following: **[12]**

- a) What is EAN rule? Explain whether EAN rule is obeyed in following complexes or not.  
i)  $[Cu (CN)_4]^{-3}$       ii)  $[Ni (NH_3)_6]^{+2}$
- b) What are fundamental postulated of Werner's coordination theory?
- c) Explain following types of corrosion:  
i) Soil corrosion      ii) Pitting corrosion      iii) Stress corrosion

**Q.4** Attempt **ANY THREE** of the following: **[12]**

- a) Discuss the bonding in following complex according to VBT:  $[Ni (CN)_4]^{2-}$ .
- b) Explain following types of structural isomerism with suitable example:  
i) Ionization isomerism      ii) Hydrate isomerism
- c) Calculate CFSE for following systems in strong octahedral field:  
i)  $d^4$  system      ii)  $d^6$  system
- d) Write a comparison between Double salt and Complex salt.

**Q.5** Attempt **ANY FOUR** of the following: **[12]**

- a) What is optical isomerism in complexes? Draw optical isomers of  $[Co (en)_3]^{+3}$ .
- b) Calculate CFSE for  $d^5$  system in weak octahedral field.
- c) Write any three postulates of V.B.T.
- d) Define following terms: i) Coordination compound ii) Polydentate ligand  
iii) Coordination number
- e) What do you mean by immersed corrosion?
- f) Draw cis-trans isomers of following complexes:  
i)  $[Co (NH_3)_3 Cl_3]$       ii)  $[Co (en)_2 Cl_2]^+$

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