BACHELOR OF SCIENCE (CBCS-2018 COURSE)
T. Y. B. Sc. Sem-V : WINTER- 2022
SUBJECT : CHEMISTRY : INORGANIC CHEMISTRY-I

Day : Friday | Time : 02:00 PM-05:00 PM

Date : 9/12/2022 | **W-18415-2022** | 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 postulates of Valence Bond Theory.

b) Write IUPAC Nomenclature for following compounds:

i) $[Co(NH_3)(NO_2)_3]$ **ii)** $K_4[Ni(CN)_4]$ **iii)** $[Cr(en)_3]Cl_3$

c) Write a note on 'Immersed Corrosion'.

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

a) What is geometrical isomerism in coordination compounds? Explain following types of geometrical isomers with suitable examples.

i) $[M(A-A)_2XY]$ **ii)** $[M A_3 X_3]$

b) Discuss postulates of Crystal Field Theory.

c) Write limitations of Valence Bond Theory.

Q.3 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) Explain following types of structural isomerism with suitable examples:

i) Linkage isomerism **ii)** Coordination isomerism

c) Write a note on : Atmospheric Corrosion

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

a) Write a comparison between Metal Complex and Metal Chelate.

b) Explain bonding and geometry in following complexes on the basis of VBT:

$[Cu(NH_3)_4]^{+2}$ **ii)** $[Mn\,Br_4]^{-2}$

c) Discuss how purity of the metal and pH of medium affects corrosion.

d) Calculate CFSE for following systems in a strong octahedral field:

i) d^5 system **ii)** d^4 system

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

a) Explain Sidgwick model for Effective Atomic Number with suitable example.

b) How nature of ligand and charge on the metal ion affect 10Dq of the complexes?

c) State the postulates of Werner's coordination theory.

d) Draw optical isomers for following type of complex with suitable example:

$[M A_2 X_2 Y_2]$

e) Discuss any three methods for prevention of corrosion.

f) What are merits and demerits of Sidgwick theory of complexes?

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