

DHANAMANJURI UNIVERSITY

JUNE – 2021

Name of Programme : M.Sc. Chemistry
Semester : Fourth
Paper Code : CHE-624
Paper Title : Inorganic Chemistry Special - IV
Full Marks : 40

The figures in the margin indicate full marks for the questions.

Answer all questions

- Although d-orbitals are unsymmetrical, d^1 and d^9 system exhibit A_{iso} . Explain. What is the effect of covalency on the value of A_{iso} ? Draw the possible structure and predict number of ^{19}F NMR peaks of ClF_3 . 5+2+3=10

Or

Explain elaborately with suitable example, the origin of fine structure in EPR spectra. Why ^{31}P NMR is important? Draw the possible structure and predict number of ^{31}P NMR spectrum of $2,2-6,6[N_4P_4Cl_4(NMe)_4]$. 5+2+3=10
- Either,
 - Give reason for the following electronic absorption transition.
 - $d \rightarrow p$ transition is allowed but d-d is forbidden
 - $^4A_2 \rightarrow ^2A_2$ transition is forbidden while $^4A_2 \rightarrow ^4T_2$ is allowed.
 - Tetrahedral complexes often absorb more strongly than octahedral complexes.
 - Explain the charge transfer transition in MnO_4^- 6+4=10

Or
 - Explain with the help of Orgel diagram the splitting of high spin Fe(III) and Co(II) in octahedral and tetrahedral field.
 - What are band width and band intensities in electronic absorption spectra? 6+4=10
- Either,
 - Explain host-guest interaction in supramolecular chemistry?
 - Write short notes on
 - podand and lariat ether
 - spherand 5+3+2=10

Or
 - Explain any four important intermolecular interactions in supramolecular chemistry Why supramolecular chemistry is a fastest growing areas of experimental chemistry? 8+2=10
- Either,
 - How many different isomers can $[Co(en)Cl_2Br_2]^-$ ion exhibit? Draw the possible geometrical isomers of $[Cr(en)_2Cl_2]^+$. Which one of them will show optical activity?
 - Write short note on ORD and its application to biological molecules. 6+4=10

Or
 - Explain the trans effect and its utility. Draw the possible product of $[PtCl_2(NH_3)_2] + Py$
 - Write short note on optical CD and its experimental limitations. 7+3=10
