Roll No.							

24-CH-21

M.Sc. II SEMESTER [MAIN/ATKT] EXAMINATION
JUNE - JULY 2024

CHEMISTRY
Paper - I
[Inorganic Chemistry - II]

[Max. Marks : 75] *[Time : 3:00 Hrs.]* *[Min. Marks : 26]*

Note : Candidate should write his/her Roll Number at the prescribed space on the question paper.
Student should not write anything on question paper.
Attempt five questions. Each question carries an internal choice.
Each question carries **15 marks.**

Q. 1 Explain how charge transfer spectra can be helpful in determining Dq and β parameter. **(15 Marks)**

OR

a) What is selection rule for electronic transition ? Explain. **(07 Marks)**

b) Explain orgel and the Tanabe - Sugano diagram for the d^3 complex $[Cr(NH_3)_6]^{3+}$ **(08 Marks)**

Q. 2 What is Spin crossover with an example and discuss the causes for spin crossover. **(15 Marks)**

OR

Write note on the following -

i) Anamalous magnetic moment. **(08 Marks)**

ii) Magnetic exchange coupling. **(07 Marks)**

Q. 3 Describe the vibrational spectra of metal carbonyls for bonding and structural elucidation. **(15 Marks)**

OR

What is Effective atomic number rules for metal carbonyls. Calculate the effective atomic number of $Fe_2(Co)_9$, $CO_2(Co)_8$, $V(Co)_6$, and $Mo(Co)_6$ which of these do not obey EAN rule. **(15 Marks)**

Q. 4 What are Carboranes ? Discuss their preparation, properties and structures. **(15 Marks)**

P.T.O.

OR

What are Boranes ? Describe the type of bonds and the structure of B_5H_{11}, B_4H_{10}, B_5H_9, B_6H_{10}, B_9H_{15} and calculate the STYX number. **(15 Marks)**

Q. 5 Describe the instrumentation method of measuring optical rotatory dispersion and discuss the CO and ORD spectra used for the study of carbohydrates. **(15 Marks)**

OR

Discuss the circular dichroism and optical rotatory dispersion and explain the optical rotatory dispersion spectra of optically active compounds **(15 Marks)**

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