

Roll No.....

Total No. of Units : 04

Total No. of Printed Pages : 03

Code No. : 02/102

Second Semester Examination, May 2019

M.Sc. CHEMISTRY

Paper - I

TRANSITION METAL COMPLEXES

& DIFFRACTION METHODS

Time : 3 Hrs.

Max. Marks : 80

- Part A and B of each question in each unit consist of very short answer type questions which are to be answered in one or two sentences.

Part C (Short answer type) of each question should be answered in

$[V(H_2O)_6]^{3+}$ 200-250 words.

Part D (Long answer type) of each question should be answered within the word limit 400-450.

Unit - I

Q.1 A. What do you mean by spectroscopic ground states? (2)

Q.1 B. Find the ground state terms for d^1 and d^9 configurations. (2)

Q.1 C. Draw the Orgel diagram for d^1 system in octahedral complex. (4)

OR

Draw the Orgel diagram for complex ion.

P.T.O.

(2)

Code No. : 02/102

Q.1 D. Write the spectroscopic method of assignment of absolute configuration in optically active metal chelates. (12)

OR

Explain how charge transfer spectra can be helpful in determining Dq and parameters?

Unit - II

Q.2 A. What is the anomalous magnetic moment? (2)

Q.2 B. What are A and E ground state terms? (2)

Q.2 C. Explain the magnetic properties of complexes containing T terms. (4)

OR

Describe the orbital contribution to magnetic moments.

Q.2 D. Write the uses of magnetism in deciding spin pair and spin free metal complexes. (12)

OR

How the Curie temperature and Neel temperature be explained by magnetic behaviour of substances?

Unit - III

Q.3 A. What is Wierl equation? Write its uses. (2)

Q.3 B. What is Ramchandran diagram? (2)

Q.3 C. Write Bragg's method to analyse the crystal structure. (4)

OR

(3)

Code No. : 02/102

How Debye-Scherer method is used to elucidate crystal structure?

Q.3 D. Describe Laue's photographic method to investigate the internal structure of crystals. (12)

OR

Describe the techniques to elucidate the structure of simple gas phase molecules.

Unit - IV

Q.4 A. What are metalloboranes? (2)

Q.4 B. Write the structures of carboranes. (2)

Q.4 C. Write the preparation and structures of isopoly acids of molybdenum. (4)

β

OR

How metal halide clusters can be prepared?

Q.4 D. Write the preparation, properties and structures of heteropoly acids of molybdenum. (12)

OR

What are higher boranes? Write their preparation, properties and structures.

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