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WT—09—2024

FACULTY OF SCIENCE

M.Sc. (First Year) (First Semester) EXAMINATION

NOVEMBER/DECEMBER, 2024

(CBCS/New Pattern)

CHEMISTRY

(CH-411)

(Inorganic Chemistry)

(Tuesday, 10-12-2024) **Time : 10.00 a.m. to 1.00 noon**

Time—3 *Hours* *Maximum Marks*—75

N.B. :— (*i*) *All* questions are compulsory.

(*ii*) Log table and calculator is allowed.

1. Answer the following (any *three*) : 15

(*a*) Give the characteristics and examples of associative type mechanism.

(*b*) Explain ligand substitution reaction and its types.

(*c*) Define nanomaterial and explain its optical properties

(*d*) What is charge transfer spectra ? Explain it in metal having mixed valence state.

(*e*) Calculate the number of microstate for p^1d^1 and ^3F.

P.T.O.

2. Answer the following (any *three*) : 15

(*a*) Explain in detail electron transfer reaction with suitable example.

(*b*) Give an account of inner sphere mechanism.

(*c*) Describe in detail scanning tunneling electron microscope.

(*d*) Find out ground state term symbol for p^3.

(*e*) Compare Orgel diagram and Tanabe Sugano diagram of d^2 configuration.

3. (*a*) Describe in detail outer sphere mechanism and mention essential requisite for electron transfer. 8

Or

Explain bottom-up approach for synthesis of nanomaterials.

(*b*) Explain S_N1 mechanism with its characteristics. 7

Or

Describe Orgel diagram for d^1 & d^9 configuration.

4. (*a*) Explain tunneling mechanism in outer sphere mechanism. 8

Or

Give an account on Nephelauxetic effect.

(*b*) Describe S_{N^1} CB mechanism with examples. 7

Or

Give the synthesis and classification of nanomaterial.

5. Write short notes on (any *three*) : 15

(*a*) Bridging ligand in ISM.

(*b*) DNA and nanomaterial

(*c*) Bioinorganic nanomaterials

(*d*) MLCT