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NEPNY—06—2023

FACULTY OF SCIENCE

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

NOVEMBER/DECEMBER, 2023

CHEMISTRY

Paper-I (SCHEC-401)

(Inorganic Chemistry)

(Wednesday, 20-12-2023) **Time : 10.00 a.m. to 1.00 p.m.**

Time—3 *Hours* *Maximum Marks*—80

N.L. :— (*i*) Question number **1** is compulsory and solve any *three* from the remaining five.

(*ii*) Calculator and log table is allowed.

1. (*a*) What are the characteristics of SN^1 mechanism of ligand substitution reaction ? 5

(*b*) Give the most suitable route to prepare cis and trans $[Pt(NH_3)_2 Cl(NO_2)]^-$ complex compounds. 5

(*c*) Explain the term nanometer, nanomaterials and nanotechnology. 5

(*d*) Ligand to metal charge transition (LMCT) spectra. Explain. 5

P.T.O.

2. (*a*) What is SN^1CB mechanism of base hydrolysis ? Discuss the evidences in favour of it. 10

(*b*) Describe about solution based synthesis of cadmium sulfide, oxide nanoparticles and Gratzel cell. 10

3. (*a*) Write in brief about the types of carbon nanotubes. 10

(*b*) Calculate the number of microstate for p^1d^1 configuration and ^3F. 10

4. (*a*) What is trans effect ? Explain associative $5N^2$ mechanism of substitution reactions in square planar complexes. 10

(*b*) Draw and explain Orgel diagrams for d^4 and d^6 octahedral complexes. 10

5. (*a*) Write the preparation of nanomaterials by electrospining method. 10

(*b*) Determine spectrosopic ground state term symbol of d^3 and d^8 configuration. 10

6. (*a*) Give an account of Anation reaction. 5

(*b*) Explain polarization theory of trans effect. 5

(*c*) Write a note on DNA and Nanomaterial. 5

(*d*) Explain nephelauxetic effect in detail. 5