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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 SN¹ mechanism of ligand substitution reaction ? 5

(b) Give the most suitable route to prepare cis and trans [Pt (NH₃)₂ Cl (NO₂)]⁻ 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 electrospinning method. 10
- (b) Determine spectroscopic 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