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NY—45—2023

FACULTY OF SCIENCE

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

NOVEMBER/DECEMBER, 2023

(New/CBCS Pattern)

CHEMISTRY

Paper–II (CH-421)

(Inorganic Chemistry)

(Wednesday, 6-12-2023)? **Time : 10.00 a.m. to 1.00 p.m.**

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 preparation of cis and trans isomers of the composition, $[Pt(NH_3)_2Cl_2]$.

(*b*) What is Catalyst ? Give its principle.

(*c*) Differentiate essential and non-essential elements.

(*d*) Calculate the number of fundamental mode of vibration of NH_3 and SO_2.

(*e*) Give the physical basic requirements of vibrational spectroscopy.

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

(*a*) Give an account for the $[Pt(NH_3)_4]^{2+}$ on treatment with Cl^- gives trans $[Pt(NH_3)_2Cl_2]$.

(*b*) Differentiate the homogeneous and heterogeneous catalyst.

(*c*) What is Na/K pump ? Explain its role in biological system.

(*d*) Explain the mossbauer spectra of $FeSO_4.7H_2O$.

(*e*) Explain the Mossbauer spectra of $FeCl_3.3H_2O$.

3. (*a*) Explain evidences in favour of the polarisation theory. 8

Or

Explain the role of catalyst in sulphur dioxide oxidation reaction.

(*b*) Differentiate between haemoglobin and Myoglobin. 7

Or

$Na_4[Fe(CN)_6]$ show single line Mossbauer spectra. Explain.

4. (*a*) Explain palladium catalysed C-C bond forming reaction in detail. 8

Or

Explain how steric effect and charge on complex affect the rate of substitution reaction in square planar complexes.

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(*b*) Give the structure and functions of Fe-S proteins. 7

Or

Explain the following points of Pyrazine radical :

(*i*) Number of lines

(*ii*) Spectrum

(*iii*) Hyperfine structure

(*iv*) Relative intensities.

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

(*a*) Nitrogenase

(*b*) Reference compound in ESR

(*c*) Tethered catalyst

(*d*) CIS effect.

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