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LB—43—2023

FACULTY OF SCIENCE

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

APRIL/MAY, 2023

(NEW/CBCS PATTERN)

CHEMISTRY

Paper-II (CH-421)

(Inorganic Chemistry Elect. Biophysical Chemistry)

(Thursday, 4-5-2022)

Time : 10.00 a.m. to 1.00 p.m.

Time—Three 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 $[\text{PtCl}_2(\text{NH}_3)\text{NO}_2]^-$.

(b) Classify catalyst with their definition and example.

(c) Give the importance of essential elements.

(d) Calculate the number of fundamental mode of vibration of N_2O and NH_3 .

(e) Write the basic principle of Mossbauer spectroscopy.

P.T.O.

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

(a) Give an account for the $[\text{PtCl}_4]^{2-}$ on treatment with NH_3 gives *cis* $[\text{Pt}(\text{NH}_3)_2\text{Cl}_2]$.

(b) Explain the language of catalyst.

(c) Explain importance of Na/K pump in biological system.

(d) Explain Mossbauer spectra of $\text{FeCl}_3 \cdot 3\text{H}_2\text{O}$.

(e) Explain the Mossbauer spectra of $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$.

3. (a) Describe the π -bonding theory of Chatt, Duncanson and Venanzi. 8

Or

Explain the role of catalyst in alkene polymerization reaction.

(b) Describe the structure and function of myoglobin. 7

Or

$\text{K}_4[\text{Fe}(\text{CN})_6]$ show single line Mossbauer spectra. Explain.

4. (a) Explain Fischer-Tropsch synthesis. 8

Or

“Bulkiness of other ligands increases, the rate of substitution decreases”.

Explain.

(b) Describe structure and function of Vitamin B_{12} . 7

Or

Explain ESR spectra of CH_3 radical in detail.

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(3)

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

- (i) Ferritin
- (ii) Reference compound in ESR
- (iii) New direction in heterogeneous catalyst
- (iv) cis effect.

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