SB—19—2022

FACULTY OF SCIENCE

B.Sc. (Fifth Semester) EXAMINATION

JUNE/JULY, 2022

(CBCS/Old Pattern)

CHEMISTRY

Paper XIII (B2)

(Physical Chemistry and Inorganic Chemistry)

(Wednesday, 8-6-2022)   **Time : 10.00 a.m. to 12.30 p.m.**

Time—2½ Hours   *Maximum Marks—40*

N.B. :— (i) Attempt *All* questions.

      (ii) Use of logarithmic table and non-functional calculator is allowed.

1. Solve any *three* of the following :   3×5=15

   (a) Explain Isopoly Anions and Isopoly Acids of Mo^{6+}.

   (b) Discuss 1 : 12 (Tetrahedral Heteroatom) polyanions with suitable example.

   (c) Explain any *two* chemical reactions of Isopolyanions and Heteropolyanions.

   (d) Define isolobal fragments. Explain $Mn(CO)_5$ and $Co(CO)_4$ organometallic fragments are isolobal with CH_3-fragment and Cl-atom.

   (e) Explain $(CH_2)_4$ and $(O_5(CO)_4]_4$ are isostructural molecules.

2. Answer any *three* of the following :   3×5=15

   (a) Derive an expression ILKOVIC equation.

   (b) What is half wave potential ? How will it be determined ?

P.T.O.

(*c*) Explain relative lowering of vapour pressure.

(*d*) Give an account of thermodynamics of an ideal solution.

(*e*) Explain chemical potential of an ideal solution.

3. Answer any *two* of the following : 2×5=10

(*a*) Explain activity of component in an ideal solution.

(*b*) What is enthalpy change of mixing ? Explain it.

(*c*) Give any *two* applications of polarography.

(*d*) An aqueous solution of a non-volatile solute boils at 100.17°C. At what temperature would it freeze ? For water k_b = 0.52 K kg mol^{-1} and k_f = 1.86 K kg mol^{-1}.