This question paper contains **2** printed pages]

NA—11—2023

FACULTY OF SCIENCE

B.Sc. (Third Year) (Fifth Semester) EXAMINATION

NOVEMBER/DECEMBER, 2023

(New/CBCS Course)

CHEMISTRY

Paper–XIII

(Physical and Inorganic Chemistry)

(Tuesday, 5-12-2023)   **Time : 10.00 a.m. to 12.00 noon**

Time—2 Hours   *Maximum Marks—40*

N.B. :— (*i*)   Attempt *all* questions.

   (*ii*)   Figures to the right indicate full marks.

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

1.   Solve any *three* of the following :   15

   (*a*)   Explain anions and isopolyacids of W^{6+} ions.

   (*b*)   Write a short note on heteropolyanions.

   (*c*)   Discuss 1 : 12 (Tetrahedral Heteroatom) Polyanions with a suitable

   example.

P.T.O.

(*d*)   What are isolobal fragments ? Explain isolobal organometallic and main group fragments with suitable example.

(*e*)   Explain $Mn(CO)_4$ organometallic fragment is isolobal with 'CH' fragment and 'P' atom.

2.   Answer any *three* of the following : 15

(*a*)   Give construction and working of droping mercury electrode.

(*b*)   What is half-wave potential ? Give its method of determination.

(*c*)   Explain types of magnetic substances

(*d*)   Explain temperature dependence of vapour pressure of solution

(*e*)   Discuss the activities of a component in ideal solutions.

3.   Solve any *two* of the following : 10

(*a*)   Write a note on chemical potential of an ideal and non-ideal solution.

(*b*)   Explain free energy change of mixing and enthalpy change of mixing.

(*c*)   Give the applications of Polarography.

(*d*)   What is the effect of temperature on diamagnetic, paramagnetic and ferromagnetic substances ?