VA—13—2024

FACULTY OF SCIENCE

B.Sc. (First Year) (First Semester) EXAMINATION

NOVEMBER/DECEMBER, 2024

(CBCS/New Pattern)

CHEMISTRY

Paper–II

(Physical and Inorganic Chemistry)

(Tuesday, 3-12-2024)   **Time : 10.00 a.m. to 12.00 noon**

Time—2 *Hours*   *Maximum Marks*—40

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

(*ii*)   Use of calculator and logarithmic table is allowed.

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

(*a*)   Explain in brief the metallic properties and flame colouration of group IA.

(*b*)   Define diagonal relationship. Give the diagonal relationship between lithium and magnesium.

(*c*)   Give the general characteristics of s-block elements.

(*d*)   Explain the balancing of redox reaction by oxidation number method.

(*e*)   Define oxidation, reduction, oxidising agent and reducing agent in terms of electronic concept.

P.T.O.

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

   (*a*)   Derive van der Waals equation.

   (*b*)   State and explain the term 'combination'. Evaluate $^9C_4$.

   (*c*)   What is adsorption isotherm ? Explain Langmuir's adsorption isotherm.

   (*d*)   Discuss the various types of elements of symmetry.

   (*e*)   Define 'critical temperature'.

        Calculate the root mean square (RMS) velocity of O_2 molecule at 37°C.

        (Given : R = 8.314 $JK^{-1}mol^{-1}$).

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

   (*a*)   Explain the determination of crystal structure of sodium chloride (NaCl) by Bragg's X-ray diffraction method.

   (*b*)   Give the difference between :

        (*i*)   Adsorption and absorption

        (*ii*)   Physical adsorption and chemical adsorption.

   (*c*)   State the postulates of kinetic theory of gases.

   (*d*)   What is S.I. unit of 'Force' and 'Density' ? Calculate the H^+ concentration of orange juice whose pH is 3.4