SB—35—2022

FACULTY OF SCIENCE

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

MAY/JUNE, 2022

(New Course)

CHEMISTRY

Paper-IV

(Physical and Inorganic Chemistry)

(Friday, 10-06-2022)	**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 is allowed.

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

    (i) Discuss different types of van der Waal's forces with examples.

    (ii) What is lattice energy ? How will you determine lattice energy using Born Haber Cycle ?

    (iii) Explain the formation of H_2 molecules on the basis of molecular orbital theory and calculate its bond order.

    (iv) Explain hybridization of IF_7 and its structure.

    (v) Differentiate between :

        (a) Ionic and Covalent bond

        (b) Polar and Non-polar Covalent bond.

2. Solve (any *three*) of the following :   15

    (i) What is catalysis ? Discuss different types of catalysis with suitable examples.

P.T.O.

(*ii*) What are colloids ? Explain lyophilic and lyophobic colloids with examples.

(*iii*) Derive the expression for radius of an orbit of an atom and give an account of hydrogen spectrum.

(*iv*) Give an account of various intermolecular forces in liquids.

(*v*)   (*a*)   Define term catalytic promotor.

    (*b*)   Explain Hund's rule of maximum multiplicity.

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

(*i*) What is enzyme catalysis ? Give different examples of it.

(*ii*) How will you prepare sols by Bredig's arc method & peptization method ?

(*iii*) What is Parachor ? Give the relation between Parachor and surface tension.

(*iv*)   (*a*)   Calculate the energy of transition involving $n_1 = 6$ to $n_2 = 3$ in a hydrogen atom. (R = 109737.32, h = 6.62 × 10^{-34} Jsec).

    (*b*)   Explain Rutherford's α-particles scattering experiments.