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PA—20—2024

FACULTY OF SCIENCE

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

MARCH/APRIL, 2024

(New Course)

CHEMISTRY

Paper—IV

(Physical and Inorganic Chemistry)

(Friday, 12-04-2024)

Time : 10.00 a.m. to 12.00 noon

Time—2 Hours

Maximum Marks—40

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

(ii) Use of logarithmic table is allowed.

1. Solve any *three* of the following : 15
- (a) Define polarising power and polarisability of ion. Explain Fajan's rule.
- (b) Define hydrogen bonding ? Explain its types with suitable examples.
- (c) Define sigma and pi bond with examples. Give limitations of VBT of covalent bonding.

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- (d) Give the basic principle of molecular orbital theory and draw molecular orbital diagram of helium.
- (e) Explain geometry and bond angle in ammonia and water molecule by VSEPR theory.

2. Solve any *three* of the following :

15

- (a) What are gels ? Give its properties.
- (b) What is catalysis ? Explain homogeneous and heterogeneous catalysis with example.
- (c) Derive an expression for energy of electron in Hydrogen atom ?
- (d) What is viscosity ? How will you determine the viscosity of a liquid by Ostwald's viscometer method ?
- (e) (i) Write a note on catalytic poisoning ?
- (ii) Explain the Hund's rule of maximum multiplicity ?

3. Solve any *two* of the following :

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- (a) What is enzyme catalysis ? Give its characteristics.
- (b) Define sols ? Explain the optical properties of sols.

- (c) In the determination of surface tension of a liquid by the drop number method, it gives 59 drops while water gave 28 drops for the same volume. The densities of the liquid and water are 0.996 and 0.800 g/cm^3 respectively. Find the surface tension of the liquid.
- (d) (i) Calculate the radius of second Bohr's orbit of H-atom.
- (ii) Write a note on quantum numbers.