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**NEPSA—1012—2025**

**FACULTY OF SCIENCE**

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

**APRIL/MAY, 2025**

**CHEMISTRY**

**(SCHECT-1151)**

**(Physical and Inorganic Chemistry-II)**

**(Friday, 11-4-2025)**

**Time : 10.00 a.m. to 12.00 noon**

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*Time—2 Hours*

*Maximum Marks—40*

*N.B. :—* (i) Q. No. 1 is compulsory.

(ii) All questions carry equal marks.

(iii) Solve any *three* of the remaining five questions.

(iv) Figures to the right indicate full marks.

1. Solve the following questions (2.5 marks each) : 4×2.5=10

(a) Explain Hund's rule of maximum multiplicity.

(b) Calculate Root Mean Square (RMS) velocity of CO<sub>2</sub> molecule at 373 K.

(R = 8.314 JK<sup>-1</sup> mol<sup>-1</sup>)

(c) Give the difference between adsorption and absorption.

(d) What are noble gases ? Give their position in periodic table.

2. Solve the following questions : 10
- (a) State the postulates of kinetic theory of gases.
  - (b) Derive van der Waals equation.
3. Solve the following questions : 10
- (a) Discuss the factors affecting adsorption.
  - (b) Explain Tyndall effect and Brownian movement.
4. Solve the following questions : 10
- (a) Define oxidation, reduction, oxidizing agent and reducing agent with example according to classical concept.
  - (b) Give any *two* methods of preparation of  $\text{XeF}_2$  and explain its structure.
5. Solve the following questions : 10
- (a) Derive an expression for the radius of *n*th Bohr's orbit of H-atom.
  - (b) Give the rules for assigning oxidation number.
6. Solve the following questions (2.5 marks each) : 10
- (a) Calculate the energy of an electron in first Bohr's orbit of H-atom.
  - (b) Derive the relationship between root mean square velocity and average velocity.
  - (c) Explain Hardy-Schulze rule.
  - (d) Give the uses of noble gases.