Avinashilingam Institute for Home Science and Higher Education for Women

Deemed to be University Estd. u/s 3 of UGC Act 1956, Category 'A' by MHRD (now MoE)
Re-accredited with 'A++' Grade by NAAC. CGPA 3.65/4, Category I by UGC
Coimbatore - 641 043, Tamil Nadu, India

Continuous Internal Assessment Test I – February 2025

Semester-II

Class : I PG **Time : 2 hours**
Branch : Chemistry **Max. Marks : 60**

23MCHC09 Physical Chemistry II

CO1: Understanding of kinetics and mechanistic aspects of chemical reactions
CO2: Understanding of kinetics and mechanistic aspects of fast reactions
CO3: Ability to distinguish the various adsorption isotherms
CO4: Identify the steps involved in studying a system quantum mechanically
CO5: Generalize the HMO treatment of simple and conjugated π electron systems

Part-A

Answer the following **6×1=6**

1.The rate law for the decomposition of N_2O_5 is___. CO1K3
a. Rate= k[N_2O] [O_4] b. Rate= k[NO_3]
c. Rate= k[NO][NO_3] d. Rate= k[N_2O_5]

2. Which of the following is not characteristic of chemisorption? CO3K2
a. It is irreversible b. It is specific
c. It is multilayer phenomenon d. Δ H is about 400kJ

3.Which is favourable for physical adsorption? CO3K2
a. High T and high P b. High T and low P c. Low T and high P d.T and P do not affect

4. The function representing matter waves must be _____ CO4K3
a. imaginary b. zero c. complex d.real

5 Number of radial nodes in a s orbital CO4K2
a. 0 b.1 c. 2 d.3

6. Wave function should be CO4K2
a. Infinite b. square integrable c.multi value d.discontinuous

Part-B

3x6=18

Answer all Questions

Each answer should not exceed 400 words or two pages

7. a. Explain steric factor and transmission coefficient CO1K2

(or)

b. Briefly explain parallel reaction CO1K4

8. a. Derive rate equation for Unimolecular reaction CO1K3

(or)

b. Enumerate on the different types of adsorption CO3K3

9. a. Derive an expression for Langmuir adsorption isotherm CO3K3

(or)

b. State and explain the postulates of quantum mechanics CO4K3

Part – C

3x12=36

Answer ALL Questions

Each answer should not exceed 800 words or four pages

10. a. Discuss the effect of temperature on reaction rate and derive Arrhenius equation CO1K4

(or)

10. b. Describe thermodynamic formulation of ARRT CO1K4

11. a. Determine the rate of H_2-Br_2 reaction CO1K4

(or)

11.b. Derive the Schrodinger wave equation. CO5K3

12. a.i)Enumerate on the information that can be extracted from wave function. CO4K3
ii) What is meant by normalization of a wave function? How is it mathematically expressed? CO4K5

(or)

12.b. State and derive the equation for Compton Effect. CO4K4

No of Copies: 20 **Staff in-charge: Dr.R.Saratha and Dr.A.Prithiba**