



## Avinashilingam Institute for Home Science and Higher Education for Women

(Deemed to be University under Category 'A' by MHRD, Estd. u/s 3 of UGC Act 1956)

Re-accredited with 'A+' Grade by NAAC. Recognised by UGC Under Section 12B

Coimbatore - 641 043, Tamil Nadu, India

**Bachelor's Degree Examination - January 2021**

**V Semester**

**Class : III UG**  
**Major : Chemistry**

**Time : 3 Hours**  
**Max. Marks : 100**

### 18BCHC15 Chemical Kinetics and Phase Rule

#### Part A

10 x 1 = 10

#### Choose the Correct Answer

- Choose the process which is the adhesion of atoms, ions or molecules from a gas, liquid or dissolved solid to a surface.  
a. reaction                      b. adsorption                      c. evaporation                      d. sorption
- Pick up the one that are substances whose solutions change colour due to changes in pH  
a. pointers                      b. detectors                      c. rectifiers                      d. indicators
- Identify the law in that the number of degrees of freedom in a system in equilibrium is equal to two plus the number of components less the number of phases.  
a. phase rule                      b. Charle's rule                      c. Gas rule                      d. process rule
- Select the one which is the process by which a substance absorbs moisture from the atmosphere until it dissolves in the absorbed water and forms a solution.  
a. luminescence                      b. appearance                      c. deliquescence                      d. fluorescence
- Find out the one which is a mixture in which the molecules of different species are distinguishable.  
a. an ideal solution                      b. a real solution  
c. a fine solution                      d. a critical solution
- Specify the one which gives a generalisation which governs the distribution of a solute between two non miscible solvents.  
a. The heat law                      b. The solution law  
c. The Nernst's distribution law                      d. the ice law
- Choose the one which is the proportionality constant in the equation that expresses the relationship between the rate of a chemical reaction and the concentrations of the reacting substances.  
a. the process constant                      b. the rate constant  
c. the reaction constant                      d. the condition constant
- Pick up the one which is a chemical reaction wherein the rate does not vary with the increase or decrease in the concentration of the reactants.  
a. first order reaction                      b. mono order reaction  
c. second order reaction                      d. Zero order reaction
- Find out the one which is a simple, but remarkably accurate, formula for the temperature dependence of the chemical reaction rate constant.  
a. the chemical equation                      b. the power equation  
c. the Arrhenius equation                      d. the Nernst equation
- Name the one which states that when suitable particles of the reactant hit each other, only a certain amount of collisions result in a perceptible or notable change.  
a. collision theory                      b. moving theory  
c. breaking theory                      d. hitting theory

**Part B**

**5 x 6 = 30**

**Answer ALL questions**

**Each answer should not exceed 400 words or two pages**

- 11.a. Write the similarities between absorption and sorption.  
(or)
- 11.b. State about the important aspects of enzyme catalysis.
- 12.a. Describe in brief about the one component system.  
(or)
- 12.b. Give a brief description about the simple eutectic system
- 13.a. State about the important aspects attached with the azeotropic mixtures.  
(or)
- 13.b. Give a brief description about the Nernst distribution law.
- 14.a. Mention the factors affecting the rate of reaction.  
(or)
- 14.b. Give the description about the expression of half-life period for first order reaction.
- 15.a. Explain the effect of temperature on rate constant.  
(or)
- 15.b. Write the significance of the entropy of activation.

**Part C**

**5 x 12 = 60**

**Answer ALL questions**

**Each answer should not exceed 800 words or four pages**

- 16.a. Explain with derivation about the Langmuir adsorption isotherm.  
(or)
- 16.b. Discuss Michelis-Menton equation with respect to catalytic reactions.
- 17.a. Elaborate the two component system with respect to the Pb-Ag system.  
(or)
- 17.b. Explain the concept of compound formation with congruent melting point.
- 18.a. With suitable example summarize the binary liquid systems with respect to completely miscible systems.  
(or)
- 18.b. Explain the concept of partially miscible liquid system with respect to phenol-water system.
- 19.a. Describe any two experimental techniques to determine order of reactions.  
(or)
- 19.b. Explain the differential equation for third order reactions.
- 20.a. Elaborate the sequential derivation and interpretation of Arrhenius parameters.  
(or)
- 20.b. Describe Lindemann's theory of unimolecular reactions.

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