22UCHCT5011

SHRIMATHI DEVKUNVAR NANALAL BHATT VAISHNAV COLLEGE FOR WOMEN
(AUTONOMOUS)
(Affiliated to the University of Madras and Re-accredited with 'A+' Grade by NAAC)
Chromepet, Chennai - 600 044.
B.Sc.Chemistry - END SEMESTER EXAMINATIONS - APRIL 2025
SEMESTER - V
22UCHCT5011 - Phase Equilibria and Chemical Kinetics

Total Duration : 2 Hrs.30 Mins. Total Marks : 60

Section B

Answer any **SIX** questions $(6 \times 5 = 30$ Marks)

1. How can the concept of degrees of freedom be used to determine the number of variables required to define a system's state? Explain with examples.
2. Explain the distribution law from thermodynamic considerations.
3. Gas dissolution in liquids varies with pressure. Explain the law that conveys the above statement. List the conditions in which the law applies.
4. Sucrose ($C_{22}O_{11}H_{22}$, 342 g mol^{-1}), like many sugars, is highly soluble in water; almost 2000 g will dissolve in 1 L of water, giving rise to what amounts to pancake syrup. Estimate the boiling point of such a sugar solution.
5. Difference between order of a reaction and molecularity of a reaction.
6. Write the acid catalyzed hydrolysis of ester and inversion of cane sugar.
7. What are the factors affecting rate of a reaction.
8. Define
   (i)Turn Over Number (ii) Degree of inhibition.

Section C

Answer any **THREE** questions $(3 \times 10 = 30$ Marks)

9. Give an example of one component system-Water with its phase diagram. Explain in detail.
10. Write the effect of addition of solute on CST.
    i. Describe the Henry's law and relationship with Raoult's law
    ii. Calculate the osmotic pressure of a 5% solution of cane sugar at 288k, R = 0.0821litre atom k-1 mol-1. The molecular mass of cane sugar is 342.
11. Derivation of integrated rate equations for first and second order reactions Half-Life period.
12. Describe Lindeman hypothesis in detail.
13. Derive Michaelis-Menten equation with its verification.

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