

AS-2051
PHYSICAL CHEMISTRY-VI C
SEMESTER -II (SYLLABUS -MAY/19)

TIME :3 HOURS

M:M: 26

NOTE : The candidates are required to attempt two questions each from Section A and B Section C will be compulsory .

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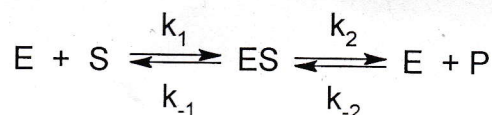
Section-A

1. Discuss two types of deviations exhibited by non-ideal solutions with examples. (4)
2. (a) What are the reasons for abnormal molecular masses of substances?

(b) Why is the elevation in boiling point of NaCl solution double than that of a glucose solution of the same concentration? (2+2)
3. What are emulsions? Discuss the methods used in finding the type of an emulsion. How are emulsions prepared? (4)
4. Discuss the various types of Colloids based upon the nature of dispersed phase particle. (4)

Section-B

5. Consider the following mechanism for an enzyme catalysis:



Where E stands for enzyme, ES stands for enzyme-substrate complex and P for product. Applying steady state approximation for [ES], derive the rate law for the formation of the product during the initial stages. Discuss the rate when $K_m \gg [S]$ and $K_m \ll [S]$.

CONTI-2

(4)

6. The rate constant for the first-order decomposition of ethylene oxide into CH_4 and CO follows the equation: $\log k \text{ (in s}^{-1}\text{)} = 14.34 - (1.25 \times 10^4 \text{ K})/T$. Calculate

- a. The activation energy of the reaction
- b. The rate constant at 700K and
- c. Frequency factor, A.

(4)

7. Explain various methods for determining the order of a reaction.

(4)

8. The $t_{1/2}$ of a reaction is halved as the initial concentration of the reactant is doubled. What is the order of the reaction?

(4)

Section-C

9. (i) State Henry's law.

(ii) What do you mean by Gold number and what is its significance?

(iii) Explain briefly acid-bases catalysis.

(iv) Describe pseudo-first order reactions.

(v) What are the units of the rate constants for zeroth order and half-order?

(5 X 2 = 10)

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