Sl. No.

No. of Printed Pages : **2**

21ICH1C3L

M.Sc. I Semester Degree Examinations, April/May - 2023

Industrial Chemistry

DSC 3 : Advanced Physical Chemistry

Time : 3 Hours Maximum Marks : 70

Note : *Answer* ***any five*** *of the following questions with question No.****1*** *(Q****1****)* **compulsory.** *Each question carries* ***equal*** *marks.*

1. (a) Discuss Gibbs-Duhem equation and its applications. **4+3+3+4**

(b) Give an account of Maxwell's relations of thermodynamics and their significance.

(c) Explain the concept of fugacity and entropy.

(d) Deduce Gibb's-Helmholtz equation.

2. (a) Explain the Lindeman theory of Unimolecular reactions. **5+5+4**

(b) State and explain the activated complex theory.

(c) Write a note on Hammett equations.

3. (a) Discuss the concept of liquid junction potential and its determination. **5+5+4**

(b) Explain the effect of temperature, pressure and concentration on energetics of cell reaction.

(c) Write a note on Debye-Huckel and Onsagar conductance equation of strong electrolytes.

4. (a) Give an account of BET equation and its significance. **5+5+4**

(b) Write a note on kinetics of Michaelis-Menten equation.

(c) Write briefly on Industrial applications of catalysts.

5. (a) Discuss the condensed phase rule for two component system with example. **5+5+4**

(b) State the phase rule and what are the applications and limitations of phase rule ?

(c) Explain Phase, component and degree of freedom.

P.T.O.

6. (a) Write a short note on Branched chain reactions and its rate expression. **5+5+4**

(b) Explain electrical double layer and its thermodynamics.

(c) Discuss the physical significance of κ (Cuppa).

7. (a) Discuss the Protolytic and Prototropic mechanism in acid base catalysis. **5+5+4**

(b) Explain the activation energies of catalyzed reactions.

(c) Explain Nernst distribution law and its applications.

8. (a) Give an account on substitution effects on the rate of reactions. **5+5+4**

(b) Discuss the Gouy-Chapman-Stern model of the electrical double layer.

(c) Explain the factors (P^H, temperature and inhibitors) effecting the enzyme catalyzed reactions.

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