Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER– III EXAMINATION – SUMMER- 2015

Subject Code: 133504 **Date: 04/06/2015**

Subject Name: Physical Chemistry

Time:02.30pm-05.00pm **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1	**(a)**	Derive Gibbs Helmholtz Equation.	**07**
	(b)	Discuss the salient features of phase diagram of sulphur system. Why can four phases of heterogeneous system not exist at equilibrium?	**07**
Q.2	**(a)**	What are Van Der Waals constants? Derive Van Der Waals Equation of state.	**07**
	(b)	Explain first law of thermodynamics. Obtain the mathematical expression for the law with conversions. Explain enthalpy and relation between ΔE and ΔH.	**07**
		OR	
	(b)	Explain the relation C_p - C_v = R. Calculate the value of ΔE and ΔH on heating 64 g of oxygen from 0^oC to 100^oC. C_v and C_p on an average are 5.0 and 7.0 cal $mol^{-1}degee^{-1}$	**07**
Q.3	**(a)**	Define the following terms with examples: 1.) Promoter 2.) Inhibitors 3.) Third law of thermodynamics 4.) Electrolyte 5.) Intensive properties 6.) Extensive properties. 7.) Eutectic point	**07**
	(b)	Write a note on galvanic cell.	**07**
		OR	
Q.3	**(a)**	Explain the relation between EMF and free energy.	**07**
	(b)	Explain principle and working of Standard Hydrogen Electrode.	**07**
Q.4	**(a)**	Define the term adsorption and absorption. Explain Adsorption theory of Catalysis.	**07**
	(b)	Define the term phase rule. Explain phase rule for water system.	**07**
		OR	
Q.4	**(a)**	Explain second order reaction with suitable examples	**07**
	(b)	Write a note on liquefaction of gases with one example	**07**
Q.5	**(a)**	Define the term chemical kinetics? Derive the mathematical equation for 1st order reaction with suitable examples.	**07**
	(b)	Write a note Enzyme catalysis.	**07**
		OR	
Q.5	**(a)**	Define the term surfactants? Give the classification of surfactants according to their charges.	**07**
	(b)	Write a note on collision theory and its limitations.	**07**

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