Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–III (OLD) - EXAMINATION – SUMMER 2017

Subject Code: 132102 **Date: 07/06/2017**

Subject Name: Metallurgical Thermodynamics

Time: 10:30 AM to 01:00 PM **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)**	Define and classify systems and differentiate between extensive and intensive properties of system.	**07**
	(b)	What is heat capacity? Explain Cp and Cv and prove that Cp>Cv.	**07**
Q.2	**(a)**	State zeroth law of thermodynamics. Define equilibrium and explain types of equilibrium of system.	**07**
	(b)	Explain different thermodynamic processes.	**07**
		OR	
	(b)	Write short note on functions of slag and basicity index.	**07**
Q.3	**(a)**	State Hess' law and Krichoff's law and give its features.	**07**
	(b)	Prove that for cyclic process work done zero.	**07**
		OR	
Q.3	**(a)**	State First law of thermodynamics and give its significance. Derive equation for first law of thermodynamics in terms of Enthalpy.	**07**
	(b)	Derive Gibb's Helmholtz equation.	**07**
Q.4	**(a)**	Explain entropy and state second law of thermodynamics. Derive Combined expression of First and Second law of thermodynamics in terms of enthalpy and free energy.	**07**
	(b)	State Third law of thermodynamics and explain Nernst Heat Theorm.	**07**
		OR	
Q.4	**(a)**	What is free energy? Explain different free energy.	**07**
	(b)	Write short note on Ellingham Diagram.	**07**
Q.5	**(a)**	Derive relation between Cp – Cv = R.	**07**
	(b)	Explain Equilibrium constant, Concept of fugacity, activity and mole fraction.	**07**
		OR	
Q.5	**(a)**	State Gibb's phase rule and explain its terminology. Also give its applications.	**07**
	(b)	Explain Raoult's, Henry's and Sievert's Law.	**07**

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