## **GUJARAT TECHNOLOGICAL UNIVERSITY** BE - SEMESTER-III • EXAMINATION – WINTER 2013

Su Su	bject bject	Code: 132102Date: 30-11-2013Name: Metallurgical Thermodynamics	
Tiı Ins	me: 0 tructio 1. 2.	2.30 pm - 05.00 pm Total Marks: 70 ons: Attempt all questions. Make suitable assumptions wherever necessary.	
	3.	Figures to the right indicate full marks.	
Q.1	(a)	What do you mean by system? Classify and explain them in brief with suitable example.	07
	<b>(b</b> )	Define Specific heat and derive relation between Cp and Cv.	07
Q.2	(a) (b)	Explain Hess's and Kirchoff's Law. State 1 <sup>st</sup> and 2 <sup>nd</sup> Law of thermodynamics and derive combined expression of 1 <sup>st</sup> and 2 <sup>nd</sup> Law of thermodynamics.	07 07
		OR	
	(b)	Draw Ellingham diagram for some very common metal oxides and give its silent features.	07
Q.3	(a) (b)	Derive Clausius-Clapeyron equation. State and Explain: 1. Raoult's law 2. Sievert's law OR	07 07
Q.3	(a) (b)	Write note on quasistatic process. Differentiate between extensive and intensive properties.	07 07
Q.4	(a) (b)	Derive phase rule. Mention its applications. Define Regular solutions. Differentiate between ideal solution and non-ideal solution.	07 07
		OR	
Q.4	(a) (b)	What is free energy? Discuss the different concept of free energy in details Write note on concept of basicity index.	07 07
Q.5	(a) (b)	Define and explain: 1. Fugacity 2. Activity 3. $0^{th}$ law of thermodynamics Explain consequences of $3^{rd}$ law of thermodynamics.	07 07
Q.5	(a)	What do you mean by phase transformation? Explain effect of pressure on phase transformation.	07
	<b>(b)</b>	What is slag? Describe various functions of slag.	07
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