

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-III • EXAMINATION – WINTER 2013****Subject Code: 132102****Date: 30-11-2013****Subject Name: Metallurgical Thermodynamics****Time: 02.30 pm - 05.00 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) What do you mean by system? Classify and explain them in brief with suitable example. **07**
(b) Define Specific heat and derive relation between C_p and C_v . **07**
- Q.2** (a) Explain Hess's and Kirchoff's Law. **07**
(b) State 1st and 2nd Law of thermodynamics and derive combined expression of 1st and 2nd Law of thermodynamics. **07**
- OR**
- (b) Draw Ellingham diagram for some very common metal oxides and give its salient features. **07**
- Q.3** (a) Derive Clausius-Clapeyron equation. **07**
(b) State and Explain: 1. Raoult's law 2. Sievert's law **07**
- OR**
- Q.3** (a) Write note on quasistatic process. **07**
(b) Differentiate between extensive and intensive properties. **07**
- Q.4** (a) Derive phase rule. Mention its applications. **07**
(b) Define Regular solutions. Differentiate between ideal solution and non-ideal solution. **07**
- OR**
- Q.4** (a) What is free energy? Discuss the different concept of free energy in details **07**
(b) Write note on concept of basicity index. **07**
- Q.5** (a) Define and explain: 1. Fugacity 2. Activity 3. 0th law of thermodynamics **07**
(b) Explain consequences of 3rd law of thermodynamics. **07**
- OR**
- Q.5** (a) What do you mean by phase transformation? Explain effect of pressure on phase transformation. **07**
(b) What is slag? Describe various functions of slag. **07**
