

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER– III(OLD) EXAMINATION – SUMMER 2019****Subject Code: 132102****Date: 11/06/2019****Subject Name: Metallurgical Thermodynamics****Time: 02:30 PM TO 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) With suitable example give different classification of system and explain. **07**
(b) For different thermodynamic terms derive combined expression of 1st and 2nd Law of thermodynamics. **07**
- Q.2** (a) Explain Hess' Law using suitable example. **07**
(b) Explain Krichoff's Law using suitable example. **07**
- OR**
- (b) State 0th and 1st Law of thermodynamics. Explain concept of internal energy and give significance of 1st Law of thermodynamics. **07**
- Q.3** (a) Differentiate between extensive and intensive properties. **07**
(b) State 2nd and 3rd Law of thermodynamics and explain concept of entropy. **07**
- OR**
- Q.3** (a) Explain Raoult's law, Henry's law and Sievert's law. **07**
(b) What is meant by Heat Capacity, give its unit and derive $C_p - C_v = R$. **07**
- Q.4** (a) What is Free Energy? Explain concept of Gibb's Free Energy. **07**
(b) Write detailed note on Ellingham Diagram and its use with suitable example. **07**
- OR**
- Q.4** (a) Explain fugacity, activity and mole fraction. **07**
(b) What is equilibrium? Explain different types of equilibrium. **07**
- Q.5** (a) What is Gibb's Phase Rule and explain terms if possible with suitable example. **07**
List its applications.
(b) Discuss different thermodynamic processes. **07**
- OR**
- Q.5** (a) What is slag? Write note on structure and composition of slag. **07**
(b) Discuss the Concept of basicity index. **07**
