Reg. No. \_\_\_\_\_\_\_\_\_\_\_\_\_



**End Semester Examination – Nov / Dec – 2019**

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| **Code :** | **17CH3007** | **Duration :** | **3hrs** |
| **Sub. Name :** | **CHEMICAL THERMODYNAMICS AND ELECTROCHEMISTRY** | **Max. Marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

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| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | Discuss Joule Thompson effect. Derive an expression for the Joule Thompson coefficient for real gas. | CO1 | 10 |
| b. | Discuss Carnot cycle and derive the expression for efficiency of heat engine. | CO1 | 10 |
| **(OR)** | | | | |
| 2. | a. | Define partial molar property and discuss about thermodynamics of open system. | CO2 | 10 |
| b. | Discuss activity, activity coefficient and fugacity. | CO2 | 10 |
|  |  |  |  |  |
| 3. | a. | Explain first and second law of thermodynamics with drawbacks. | CO1 | 10 |
| b. | Discuss Nernst theorem. | CO2 | 10 |
| **(OR)** | | | | |
| 4. | a. | Discuss about the expansion of ideal gas and related changes in thermodynamic properties. | CO1 | 10 |
| b. | Derive Gibbs Duhem equation. | CO2 | 10 |
|  |  |  |  |  |
| 5. | a. | Derive Fermi Dirac Statistics. | CO3 | 10 |
| b. | Explain the concept of thermodynamics in terms of statistical mechanics. | CO3 | 10 |
| **(OR)** | | | | |
| 6. | a. | Derive Bose Einstein statistics for degenerate energy levels. | CO3 | 10 |
| b. | Discuss molecular partition function. Derive an expression for it and give applications. | CO3 | 10 |
|  |  |  |  |  |
| 7. | a. | Derive Sackur-Tetrode equation. | CO4 | 10 |
| b. | Discuss in detail Dorn effect. | CO5 | 10 |
| **(OR)** | | | | |
| 8. | a. | Derive an expression for Einstein theory of heat capacities. | CO4 | 10 |
| b. | Discuss internal energy and entropy in terms of partition function. | CO4 | 10 |
|  | | **Compulsory**: |  |  |
| 9. | a. | Discuss theories of electrical double layer. | CO5 | 10 |
| b. | Derive Butler Volmer equation. | CO5 | 10 |