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



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

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| **Code :** | **14PH2007** | **Duration :** | **3hrs** |
| **Sub. Name :** | **HEAT AND THERMODYNAMICS** | **Max. Marks :** | **100** |

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

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| **Q. No.** |  | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. |  | Explain in detail the Joule-Thomson’s porous plug experiment with a neat schematic diagram. | CO1 | 20 |
| **(OR)** | | | | |
| 2. |  | Using Joule-Thomson effect and the principle of regenerative cooling method, discuss how Linde was successful in liquefying air. | CO1 | 20 |
|  |  |  |  |  |
| 3. |  | Explain in detail the isothermal expansion and adiabatic expansion of a gas. Calculate the amount of work done. | CO2 | 20 |
| **(OR)** | | | | |
| 4. |  | Deduce the expression for Clausius-Clapeyron’s first latent heat equation. | CO2 | 20 |
|  |  |  |  |  |
| 5. |  | The Carnot cycle uses only two thermal reservoirs, one at high temperature T1 and the other at two temperature T2. Validate this statement with necessary equations. | CO3 | 20 |
| **(OR)** | | | | |
| 6. |  | A refrigerator or a heat pump that operates on the reversed Carnot cycle is called a Carnot refrigerator. Discuss this process in detail and hence, find the coefficient of performance of a refrigerator. | CO3 | 20 |
|  |  |  |  |  |
| 7. |  | **Carnot cycle** is a thermodynamic cycle that is known for the best possible efficiency. Find its efficiency based on T-S diagram. | CO4 | 20 |
| **(OR)** | | | | |
| 8. |  | Find the entropy of a perfect gas in terms of;   1. Temperature and volume 2. Temperature and pressure. | CO4 | 20 |
|  | | **Compulsory**: |  |  |
| 9. |  | Sketch and derive the general expression for Maxwell’s thermodynamic relations from first principles. | CO5 | 20 |