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



**End Semester Examination – Nov/Dec - 2017**

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

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

|  |  |  |  |  |
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| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | Name the statistics depending upon three different kinds of particles. | CO1 | 6 |
| b. | Summarize the three laws of probability theory with examples. | CO1 | 14 |
| (OR) | | | | |
| 2 | a. | Calculate the probability that in tossing a coin 10 times, we get i. 6 heads and 4 tails ii. 5 heads and 5 tails iii. 7 heads and 3 tails iv. 2 heads and 8 tails. | CO3 | 12 |
|  | b. | We throw a die twice and obtain two numbers. Identify the probability that these two numbers are 2 and 3 precisely in that order. | CO3 | 2 |
|  | c. | From a group of 7 men and 6 women, five persons are to be selected to form a committee so that at least 3 men are there on the committee. In how many ways can it be done? | CO3 | 3 |
|  | d. | In how many different ways can the letters of the word 'LEADING' be arranged in such a way that the vowels always come together? | CO3 | 3 |
|  |  |  |  |  |
| 3 | a. | Discuss the various types of Ensembles. | CO2 | 15 |
|  | b. | Tabulate the comparison of ensembles. | CO2 | 5 |
|  |  | (OR) |  |  |
| 4 |  | Determine the partition function and its relation with thermodynamic quantities. | CO2 | 20 |
|  |  |  |  |  |
| 5. |  | Derive the expression for Vander – Waal’s equation with its critical constants. | CO2 | 20 |
|  |  | (OR) |  |  |
| 6 | a. | Calculate the Vander Waals constants for dry air, given that Tc =132K , Pc =37.2 atmospheres and R per mole =82.07 cm3 atoms K-1 | CO3 | 5 |
|  | b. | Diagrammatically explain the triple point with a neat diagram. | CO1 | 10 |
|  | c. | List the difference between real and non-real gases. | CO1 | 2 |
|  | d. | Name the types of magnetism. | CO1 | 3 |
|  |  |  |  |  |
| 7 | a. | State and derive Planck’s Radiation law. | CO2 | 16 |
|  | b. | Define photon gas. | CO2 | 4 |
|  |  | (OR) |  |  |
| 8 |  | Explain in detail about Bose – Einstein Distribution Law with suitable derivation. | CO2 | 20 |
|  | |  |  |  |
|  | | **Compulsory:** |  |  |
| 9. |  | Derive the general expression and six different relations for Maxwell thermodynamic relations. | CO1 | 20 |

ALL THE BEST