Roll No. | | | | | | | | | | | | **Total No. of Pages : 02**

Total No. of Questions : 09

B.Sc (Non Medical) (Sem.–3)

THERMAL PHYSICS

Subject Code : BSNM-304-18

M.Code : 76903

Date of Examination : 23-12-22

Time : 3 Hrs. **Max. Marks : 50**

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying ONE marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.**

SECTION-A

1. Write briefly :

a) What is the concept of reversible engine?

b) '*Efficiency of Carnot's engine does not depend upon the properties of the working substance.*' Why?

c) Entropy of universe always increases. Why?

d) Why only four thermodynamical variables are defined?

e) Define critical temperature of a gas.

f) What is the probability of drawing a king from a pack of 52 cards?

g) What is meant by the term thermodynamic probability of a microstate?

h) What are the main points of difference between classical and quantum statistics?

i) Define phase space.

j) What are fermions?

SECTION-B

2. State and prove Carnot's theorem for a reversible heat engine.

3. Derive Claussius Clapeyron's latent heat equation using thermodynamic relations.

4. Explain the terms Macrostate and Microstate. Illustrate by distributing four particles in two compartments.

5. Calculate the number of different arrangements of 10 indistinguishable particles in 15 cells of equal a priori probability considering that one cell contains only one particle.

6. Name the three kind of statistics. Explain the distinguishing features of Maxwell-Boitzmann, Bose-Einstein and Fermi-Dirac statistics.

SECTION-C

7. What is Joule-Thomson effect? Obtain an expression for change in temperature during Joule-Thomson effect. Give thermodynamical treatment to explain cooling and heating effect.

8. Discuss the distribution of 'n' distinguishable particles into 'k' compartments of unequal size each one of which is further subdivided into 'g' cells of equal a priori probability.

9. What is photon gas? Starting from Bose Einstein energy distribution law derive Planck's law of black body radiation.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.