

Enrollment No: _____ Exam Seat No: _____

C.U.SHAH UNIVERSITY

Summer Examination-2019

Subject Name: Statistical Mechanics and Plasma Physics

Subject Code: 4SC06SMP1

Branch: B.Sc. (Physics)

Semester: 6

Date: 25/04/2019

Time: 10:30 To 01:30

Marks: 70

Instructions:

- (1) Use of Programmable calculator & any other electronic instrument is prohibited.
- (2) Instructions written on main answer book are strictly to be obeyed.
- (3) Draw neat diagrams and figures (if necessary) at right places.
- (4) Assume suitable data if needed.

Q-1 Attempt the following questions: (14)

- a) What ionization?
- b) What is resonance?
- c) How to produce external field for ionization of gases.
- d) What is the fourth state of matter?
- e) What is the Radiation?
- f) What is photo ionization?
- g) What are the thermodynamics parameters?
- h) What is recombination phenomenon?
- i) Give any two examples of plasma.
- j) What is entropy?
- k) What is coordinate system?
- l) At which dimension particle will follow uncertainty principle.
- m) What is phase space?
- n) What is non equilibrium condition?

Attempt any four questions from Q-2 to Q-8

Q-2 Attempt all questions (14)

- (a) Explain briefly, Macroscopic and Microscopic states in statistical mechanics. **8**
- (b) Explain the additive property of Entropy. **6**



Q-3	Attempt all questions	(14)
(a)	What is Liouville's theorem? Explain	8
(b)	What is Ensemble? What are the different groups of microstate?	6
Q-4	Attempt all questions	(14)
(a)	What is Nernst's heat theorem, Explain?	7
(b)	Explain micro canonical ensembles.	7
Q-5	Attempt all questions	(14)
(a)	Explain Maxwell Boltzmann distribution of velocities.	6
(b)	What is Gibbs Paradox? Explain.	8
Q-6	Attempt all questions	(14)
(a)	What is Fermi Dirac distribution law?	8
(b)	What is quantum statistics? How many types of quantum statistics are there?	6
Q-7	Attempt all questions	(14)
(a)	State and explain the methods for production of plasma. What are the applications of Plasma?	
Q-8	Attempt all questions	(14)
(a)	Show that the Planck's law of entropy is the bridge of the statistical and thermodynamics.	

