<b>Enrollment No:</b>	Exam Seat No:

## C. U. SHAH UNIVERSITY Summer Examination-2022

**Subject Name: Thermal Physics and Statistical Mechanics** 

Subject Code: 4SC03TPS1 Branch: B.Sc. (Chemistry, Mathematics)

Semester: 3 Date: 27/04/2022 Time: 02:30 To 05:30 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)
Q-1		Define Compressibility.	01
		State the Zeroth law of thermodynamics.	01
	-	Define Internal energy.	01
	-	Give classification of Quantum Statistics.	01
		Define Temperature.	01
		What is Phase space?	01
		What is Macroscopic state?	01
		What is meant by Mean free path?	01
	-	Define Gibbs energy.	01
		Give statement of Equipartition theorem.	01
	-	What are Fermions?	01
	1)	Define Carnot cycle.	01
	m)	Define Enthalpy.	01
	n)	Define Joule- Thompson Effect.	01
Attem	pt any	four questions from Q-2 to Q-8.	
Q-2		Attempt all questions	(14)
	a)	Explain in details Works-done during an adiabatic process	07
	<b>b</b> )	Derive Maxwell's relation for Thermodynamics.	07
Q-3		Attempt all questions	(14)
Q U		Explain in detail TdS equations.	07
	-	Derive relation between $C_p$ - $C_v$ .	07
Q-4		Attempt all questions	(14)
<b>V</b> -1		What is Carnot cycle? Explain in details Carnot Theorem.	07
		Derive Maxwell's law of distribution of velocity and give its	07
	-	experimental verification.	, ,



Q-5		Attempt all questions	(14)
	a)	Explain in detail Fermi-Dirac Distribution Law.	07
	<b>b</b> )	Explain in details Temperature-Entropy diagram.	07
Q-6		Attempt all questions	(14)
	a)	Write a short note on Clausius- Clapeyron relation.	07
	<b>b</b> )	Explain Macroscopic and Microscopic states in details.	07
<b>Q-7</b>		Attempt all questions	(14)
	a)	Explain in details Bose Einstein Distribution Law.	07
	<b>b</b> )	Explain in details work-done during Isothermal process.	07
Q-8		Attempt all questions	(14)
	a)	Explain in details application of First law of thermodynamics.	08
	<b>b</b> )	Write a short note on reversible and Irreversible process.	06

