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

## C.U.SHAH UNIVERSITY Summer Examination-2018

Subject Name: Thermal Physics and Statistical Mechanics

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

Semester: 3 Date: 02/04/2018 Time: 2:30 To 5:30 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)	Give the statement of first law of thermodynamics.	1
	<b>b</b> )	Define Temperature.	1
	<b>c</b> )	Give the statement of Zeroth law of thermodynamics.	1
	d)	Define Gibbs energy.	1
	e)	What is Macroscopic state?	1
	f)	What is Phase space?	1
	g)	What is meant by mean free path?	1
	h)	Give statement of Equipartition theorem.	1
	i)	Give one comparison of three statistics.	1
	j)	Define Microscopic State.	1
	k)	Define Carnot cycle.	1
	l)	Define viscosity.	1
	m)	Define. Heat energy.	1
	n)	Define Internal energy.	1
Attem	pt any i	four questions from Q-2 to Q-8	
Q-2		Attempt all questions	(14)
	a)	Write a short note on reversible and Irreversible process.	5
	b)	Explain in details Tds equations.	5
	<b>c</b> )	Derive relation between Cp-Cv.	4
Q-3		Attempt all questions	(14)
	a)	Derive Maxwell's relation for thermodynamics.	6
	<b>b</b> )	Explain in details application of First law of thermodynamics.	6 5
	<b>c</b> )	Explain in details Works-done during an adiabatic process.	3
Q-4		Attempt all questions	(14)
	a)	What is Carnot cycle? Explain in details Carnot Theorem.	7
	<b>b</b> )	Derive Maxwell's law of distribution of velocity and give its experimental	7
0.5		verification.	(14)
Q-5		Attempt all questions	(14)



	a)	Explain in detail Fermi-Dirac distribution law.	7
	<b>b</b> )	What is Phase space? Explain it in two three sentences.	4
	c)	Explain in details law of Equipartition of energy.	3
Q-6		Attempt all questions	(14)
	a)	Explain macroscopic and microscopic states in details.	5
	<b>b</b> )	Explain in details Temperature-Entropy diagram.	5
	c)	Explain Internal Energy in details.	4
Q-7		Attempt all questions	(14)
	a)	Explain in details Bose Einstein distribution law.	8
	<b>b</b> )	Write a short note on third law of thermodynamics.	4
	c)	Explain Enthalpy in details.	2
Q-8		Attempt all questions	(14)
	a)	Explain transport phenomena and discuss about Viscosity.	6
	<b>b</b> )	Explain in details work-done during isothermal process.	4
	c)	Write a short note on Clausius- Clapevron relation.	4

