Enrollment No: _____ 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)	Define Temperature.	1
c)	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

Attempt any 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**
c)	Derive relation between Cp-Cv.	**4**

Q-3 Attempt all questions (14)

a)	Derive Maxwell's relation for thermodynamics.	**6**
b)	Explain in details application of First law of thermodynamics.	**5**
c)	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)	Derive Maxwell's law of distribution of velocity and give its experimental verification.	**7**

Q-5 Attempt all questions (14)

	a)	Explain in detail Fermi-Dirac distribution law.	**7**
	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)	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)	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)	Explain in details work-done during isothermal process.	**4**
	c)	Write a short note on Clausius- Clapeyron relation.	**4**