

**SARDAR PATEL UNIVERSITY**  
**Programme & Subject: M.Sc (Mathematics)**  
**Semester: IV**  
**Syllabus with Effect from: November-2013**

<b>Paper Code: PS04EMTH17</b>	<b>Total Credit: 4</b>
<b>Title Of Paper: Statistical Mechanics - II</b>	

Unit	Description in detail	Weighting (%)
I	Phase transition, one dimensional Tonks and Takahashi gases, Yang Lee theory of phase transition.	25%
II	Van der Waal's theory of gas liquid transitions, Curie Weiss theory of magnetic transitions. Algebraic approach to Ising model, lattice gas and binary alloy, one dimensional model and transfer matrix.	25%
III	Transfer matrix for two and higher dimensional model, discussion of Onsager solution of two dimensional model, correlation function, eigen value degeneracy and long range order.	25%
IV	Combinatorial approach to Ising model, applications of Ising model to biology like hemoglobin, enzymes and DNA.	25%

**Basic Text & Reference Books:-**

- Colin J. Thompson, Mathematical statistical mechanics, Princeton University press, 1972.
- Huang, K., Statistical mechanics, Wiley Eastern Ltd. 1963.
- Laud, B.B., Introduction to statistical mechanics, MacMillan Indian Ltd., 1981.

