



**V.P & R.P.T.P. SCIENCE COLLEGE**

**B.Sc. (SEM-5) Examination 2016**

**Subject: Physics (Thermodynamics and statistical Physics)**

**Course: US05CPHY04**

**Date: 04/10/2016**

**Time: 11:00 to 12:30**

**Day: Tuesday**

**Total Marks: 25**

**Q.1 M.C.Q.**

**3**

- (1) An adiabatic process occurs at constant .....
- (a) Temperature      (b) Pressure      (c) Heat      (d) Volume
- (2) The mean kinetic energy of a particle per degree of freedom is
- (a)  $kT$       (b)  $\frac{1}{2}kT$       (c)  $\frac{3}{2}kT$       (d)  $\frac{5}{2}kT$
- (3) If the system is in the .....condition the phase space is known as the  $\Gamma$  space.
- (a) Gaseous      (b) liquid      (c) solid      (d) none of above

**Q.2 Short question (any two)**

**4**

- (1) Define Specific latent heat and phase transition.
- (2) Define Paramagnetic and Ferromagnetic material.
- (3) State Nernst's heat theorem.
- (4) Define Chemical potential and Degeneracy.

**Q.3** Deduce Clausius-Clapeyron's equation for the change of equilibrium pressure of two phases with temperature.

**6**

**OR**

Show that in a throttling process the initial and final enthalpies of the system are equal.

**6**

**Q.4** Show that the probability density is constant along the phase trajectories of the phase points.

**6**

**OR**

What is Gibbs paradox in microcanonical ensemble? How it is removed.

**6**

**Q.5** Derive an expression for Maxwell distribution of velocities.

**6**

**OR**

Derive an expression for canonical distribution.

**6**