V.P. & R.P.T.P. SCIENCE COLLEGE VALLABH VIDYANAGAR

B.Sc. Semester -V

Internal Examination

Subject: Physics | Course Code: USO5CPHY04

Date: 07 -10-2019, Monday | Time: 11:00 am to 12:15 pm

[Total Marks: 25]

Q-1 Answer the following MCQ's with correct option. (1 Mark each) (5)

1 Helmholtz function is given by

a) H= U+W b) G= h-TS c) h= U+PV d) F= U- TS

2 Which of the following expression represent second law of thermodynamics?

a) δQ =TdS b) ds = PV c) T= dS PdV d) S= PV

3 Mean kinetic energy of a particle per degree of freedom is ___.

a) <E>= $\frac{3}{2}KT$ b) <E>= $\frac{5}{2}KT$ c) <E>= $\frac{1}{2}KT$ d) None of above

4 Which of the following parameters remains constant in canonical ensemble?

a) [V,E,T] b) [N,V,T] c) [μ,V,T] d) [μ,N,E]

5 The spin quantum number (s) of the ___ is zero.

a) Photon b) positron c) α -particle d) π – meson

Q-2 Derive Maxwell's thermo dynamical relations. Also show derivation of relation for taking 'S' and 'V' as independent variables. (5)

OR

Q-2 Derive Clausius - Clapeyron latent heat equation. And shows the graphical representation of Gibb's function, Entropy and volume.

Q-3 Show that the probability density is constant along the phase trajectories of the phase points. (5)

OR

Q-3 Define Micro canonical ensemble and obtain Gibb's micro canonical distribution function. Also give the postulate of equal priori probability.

Q-4 Derive an expression for grand canonical distribution of a system in quantum statistics. (5)

OR

Q-4 Discuss different thermo dynamical quantities for canonical ensemble.

Q-5 Discuss the Maxwell-Boltzmann distribution function of a particle among various states and obtain the condition for its application. (5)

OR

Q-5 Discuss the Bose- Einstein distribution function of the particle among various states.

----------xxx----------