

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

T.Y.B.SC.SEM-I

FIRST INTERNAL TEST

PHYSICS USO5CPHY04

DATE-06/10/2017

FRIDAY

Time-11.am to 12.30pm

TOTAL MARK-25

Q-1 Multiple choice question.

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1. Gibb's free energy is given by

- (A) $H=U+W$ (B) $G= h-TS$ (C) $h=U=PV$ (D) $F=U-TS$

2. The Stirling formula is analogous to of \ln .

- (A) Limit (B) Differentiation (C) Integration (D) None of above

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

- (A) $\langle E \rangle = \frac{3}{2}KT$ (B) $\langle E \rangle = \frac{5}{2}KT$ (C) $\langle E \rangle = \frac{1}{2}KT$ (D) None of above

Q.2 Short questions. (Any two)

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1. State second law of thermodynamics in terms of entropy.

2. Explain: Postulate of equal a priori probability.

3. Define: Chemical potential.

Q.3 Derive Clausius-Clapeyron's latent heat equation.

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OR

Prove that in a throttling process, the initial and the final enthalpies are equal.

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Q.4 State and prove Liouville's theorem.

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OR

Derive an expression for entropy of a perfect gas in a microcanonical ensemble

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Q.5 Derive expression for Maxwell distribution of velocities of a particle

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OR

Derive an expression for grand Canonical distribution of a system in quantum and classical statistics.

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