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School of Basic Sciences

Master of Science in Chemistry
Mid Term Examination - May 2024

Duration : 90 Minutes
Max Marks : 50

Sem II - C1PK203B - Physical Chemistry-IIGeneral Instructions

Answer to the specific question asked

Draw neat, labelled diagrams wherever necessary

Approved data hand books are allowed subject to verification by the Invigilator

- 1) Explain in how many ways 3 identical nondistinguishable molecules can be distributed in 5 energy states? K2 (2)
- 2) What are the statistical ensembles commonly used in statistical thermodynamics? K1 (3)
- 3) Explain acid-base catalysis, and how does it differ from other types of catalysis? K2 (4)
- 4) Illustrate different features of a partition function? K2 (6)
- 5) illustrate the phenomenon of adsorption using simple langmuir adsorption isotherm? K3 (6)
- 6) identify the relation between internal energy and partition function of a system? K3 (9)
- 7) Analyse the contribution of vibrational partition function towards internal energy at $T = 0$ and $T = \infty$? K4 (8)
- 8) Analyse the relation between partition function and thermodynamics quantities like internal energy, enthalpy and entropy of a system? K4 (12)

OR

Analyse relation between heat capacity at constant volume and heat capacity at constant pressure with partition function? K4 (12)