

West Bengal State University
B.A./B.Sc./B.Com. (Honours, Major, General) Examinations, 2013
Part - III

CHEMISTRY — HONOURS

Paper-V (GR. - A + B)

Duration : 4 Hours

[Maximum Marks : 100

The figures in the margin indicate full marks.

Answers to different Groups must be made in separate answer-scripts.

GROUP - A

(50 Marks)

Answer any *three* questions, taking *one* from each Unit.

UNIT - I

1. a) What is thermodynamic probability ? Arrive at the Boltzmann distribution formula for an ensemble of non-degenerate system. 1 + 5
- b) Explain qualitatively the reason as to why the vapour pressure of the solution of a non-volatile solute is lower than that of the pure solvent.
 At 27°C an aqueous solution of a carbohydrate containing 18 gms per 100 ml of the solution is found to be isotonic with another aqueous solution 100 ml of which contain 2.923 gms of sodium chloride. Find the molecular weight of the carbohydrate. 2 + 2
- c) Two metals which are completely soluble in the liquid state but show no solid-solid solubility form an eutectic. Apply the phase rule to find whether the eutectic point is invariant or not. How can it be verified that the eutectic mixture is not a compound ? 2 + 2
- d) State Konoualoff's rule. 2
2. a) Write a note on Nernst heat theorem. 2
- b) Express internal energy (U) and Gibbs free energy (G) of a system in terms of partition function. 2 + 2

