# B. N. BANDODKAR COLLEGE OF SCIENCE, THANE

## FIRST TERMINAL EXAMINATION, OCTOBER -2011.

## S. Y. B. Sc.

## Chemistry-I

**Time : 2 hrs** **Marks: 60**

**N.B. : 1) All questions are compulsory**

**2) Figures to the right indicate full marks.**

**3) Use of log tables/non-programmable calculator is allowed.**

Q. 1 A a) Mention any two significances of Gibb's free energy. 2

OR

a)In a certain chemical process ΔH IS -8.04KJ and ΔS is -12.48 $JK^{-}$Calculate the maximum temperature up to which the process will be spontaneous assuming ΔG=0 2

b) Define partial molal property. 2

c) Write the Clapeyron equation 1

B

a)State Kohlrausch's law of independent migration of ions. 2

OR

a)State the difference between electronic and electrolytic conduction. 2

b)Define equivalent conductance. 1

OR

b)Define transport number. 1

c)What is the effect of temperature on metallic conductivity. 1

d)Give the unit of Conductance. 1

C a)Define the terms (i) precision (ii) absorbance 2

OR

a) Explain Beer's law. 2

b) If the percentage of transmittance is 35.48, what is the absorbance? 2

c) Define the term wavelength of maximum absorption. 1

Q 2 (A) Mention the application of Classius-Clapeyron equation. 3

(B) Attempt **ANY THREE** questions of the following. 12

a)Derive the Gibb's-Duhem equation.

b)Derive the expression for VantHoff's reaction isotherm.

c)Derive thermodynamic derivation of equilibrium constant

d)Explain the terms:i) Activity and Activity coefficient

ii) Partial molal volume and chemical potential.

e)The equilibrium constant (Kp) for the dissociation of 2H2S =2H2+S2 is $1.18\times10^{-2}$at 1338 K and the enthalpy change is 177.4 KJ. Calculate the equilibrium constant at 1578K ( Given R=8.314J.K-1.mol-1).

**PTO**

Q3 (A) Transport number of $K^+$ in 1N KCl was determined by moving boundary method with $BaCl_2$ as the following electrolyte. A current of 0.0142 amperes was passed through the solution for 1675 seconds. In same time interval, the boundary swept a volume of 0.1205 $cm^3$, Calculate the transport number of $K^+$. (Given:96500Coulombs). 3

(B) Attempt **ANY THREE** question from the following 12

a)Discuss various factors affecting the transport number of an ion.
b)Discuss any one application of Kohlrausch's law of independent migration of ions.
c)Explain that the relaxation effect and electrophoretic effect and responsible for the decrease in equivalent conductance.
d)Explain the variation of molar conductance with Concentration.
e)Describe the determination of cell constant of a conductivity cell.

Q 4 (A) Explain qualitative analysis with examples. 3

(B) Attempt **ANY THREE** question from the following 12

a) Explain calibration curve method.
b) What are the application of analytical chemistry?
c) Write a note on single beam colorimeter.
d) Write a on barrier layer cell.
e)A solution of substance having molar absorptivity of 9500$dm^3$ mole $^{-1}$ $cm^{-1}$ gives an absorbance of 0.70 using 1cm long cell. Calculate the concentration and % of transmittance of the solution.

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