Vidya Prasarak Mandal's

B. N. Bandodkar college of science, Thane-400 601.

A.T.K.T EXAMINATION, August -2011.

S. Y. B. Sc.

Date : **Chemistry- I** **Time : 3 hrs**

Day : **Marks: 90**

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.

4) Answers to two sections should be written in same answer book.

SECTION - I

Q 1.	**A**	Explain i) Partial molal volume.	**3**
	B	Attempt any **three** of the following :-	
	i	Write a note on Gibbs Helmholtz equation.	**4**
	ii	Derive Clapeyron equation.	**4**
	iii	The vapour pressure of water at 363K is 70.15 kNm $^{-2}$ and the molal heat of vaporization between 363 K and 373 K is 40.85 kJmol $^{-1}$. Calculate the vapour pressure at 373 K. (R= 8.314 J/mol/K).	**4**
	iv	Derive the relation of Van't Hoff's reaction isotherm.	**4**
	v	How is K_P related with K_c ?	**4**
Q2.	**A**	Explain :- Electrolytic conductance .	**3**
	B	Attempt any **three** of the following :-	
	i	Explain the Debye Huckel Theory of strong electrolytes.	**4**
	ii	Explain how dissociation constant of a weak electrolyte is determined .	**4**
	iii	Write a note on determination of transport number by moving boundary method.	**4**
	iv	Explain the terms molar conductance and Absolute ionic mobility.	
	v	At 298 K ,the equivalent conductance of 0.02 mol dm^3 of $AgNO_3$ solution is 128.8 x 10 $^{-4}$Sm^{2}gmEq $^{-1}$ and transport number of Ag^+ in the solution is 0.477. Calculate equivalent conductance of the Ag^+ and NO^{-1} and their mobilities.	**4**
Q3.	**A**	Write a note on importance of analytical chemistry.	**3**
	B	Attempt any **three** of the following :-	
	i	Explain calibration curve method.	**4**
	ii	Write a note on single beam photometer.	**4**
	iii	State the limitations of Beer Lambert s law.	**4**
	iv	A 5 x10 $^{-5}$ M solution gave aborbance o.75 when placed in 1.0 cm cell at 520 nm, Calculate Molar absorptivity and % transmittance of the solution.	**4**
	v	Explain the barrier layer cell.	**4**

P.T.O.

SECTION - II

Q 4.	**A**	Define component, phase and degree of freedom.	**3**
	B	Attempt any **three** of the following :-	
	i	Discuss in detail with neat diagram : Steam distillation.	**4**
	ii	What are partially miscible liquids? Explain the terms UCST and LCST.	**4**
	iii	Write a note on Nernest distribution law	**4**
	iv	Give the criteria for ideal solutions.	**4**
	v	Write a note on breaking up of an Azeotropic mixture.	**4**
Q5.	**A**	What is a reversible cell ?	**3**
	B	Attempt any **three** of the following :-	
	i	Give the comparision between primary and secondary cell.	**4**
	ii	Describe the relation for Henderson equation for pH of an acid buffer.	**4**
	iii	Describe the Calomel electrode with a suitable diagram.	**4**
	iv	Calculate the electrode potential of the following single electrode at 298 K. Ag I AgCl I Cl- (a = 0.015) Given E_0 Ag I AgCl = 0.2224 V, R = 8.314, F = 96500 Coulombs	**4**
	v	Derive the relation of Nernest equation for potential of a galvonic cell	**4**
Q6.	**A**	Define: (i) Titrand, (ii) End point, (iii) Equivalence point.	**3**
	B	Attempt any **three** of the following :-	
	i	Write a note on Oswald's theory of acid-base indicator theory.	**4**
	ii	Describe the technique of calibration of volumetric flask.	**4**
	iii	Give the advantages and disadvantages of conductometric titrations..	**4**
	iv	Explain principle of potentiometric titrations.	**4**
	v	Explain : Photometric titrations.	**4**

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