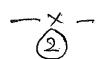
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## [97] SARDAR PATEL UNIVERSITY

M.Sc. (Chemistry) Examination, Fourth Semester

		Date: 20-03-2019								
	Wedn	esday, Time: 2.00 p.m. to 5.00 p.m.								
		Subject: Electro-Analytical Methods Paper: PS04CANC22  [Total Marks: 70]								
N.B.	(2) A	gures to the right indicate full marks. ttempt all questions.								
2.1		Select the correct answer from each of the following: (0								
1.	(a)									
2.	(a) c (b) p	amperometric titration, the results of the titration are independent of the  concentration (c) capillary characteristic  potential (d) diffusion co-efficient								
3.	Pote	entiometric titration can be carried out on micro-level up toM.								
	(a) 1	$0^{-4}$ (b) $10^{-5}$ (c) $10^{-6}$ (d) $10^{-7}$								
4.	In high frequency method, the titrimeter can be easily connected to a potentiometic recorder, so that the variation of current may be plotted as a function of									
	time (a) C	Oscillator (b) Inductive (c) Capacitative (d) Diffusion								
5.	the	resistance to be measured may be of convenient magnitude short (b) equal (c) long (d) not equal								
6.	Only when written as areaction will the sign of the e.m.f. of the half-reaction corresponds to the sign of the electrode potential.									
	(a) oxidation (b) reduction (c) redox (d) and above									
7.	at s	The DME can not be used at potentials more positive than 0.3 V because Hg at such potentials.  (a) reduce (b) oxidize (c) remains inert (d) remains active								
8.	Calcium selective electrode is an example ofelectrode.  (a) Glass (b) Solid-state (c) Molecular selective (d) Liquid									
0.2	membrane Answer the following: <b>(Any Seven)</b>									
Q.2		Write down ILKOVIC equation and explain terms involved in it.								
	[1] [ii]	Define the terms: Ionic conductance and migration current.								
	(iii)	Discuss alkaline error and acid error.								
	[iv]	the involved in amperometry								
	[v]	and all of the second algorithms call								
	[vi]	to the second to maxima								
	[vii]	Chief frequency conductance method.								
	[viii]	Define: Electrode potential and Diffusion potential.								
	[ix]	Derive: $E^{\circ}=(RT/nF) \ln k$	))							

Q.3 [a]	Discu	ss on solid state ar	nd liquid	membran	ie ion sele	ctive elec	trode.		(6)			
[b]	Answe	er the followings:							(6)			
[	i] Writ	e the advantages a	and disad	vantages	of hydrog	en electro	ode.					
[i	i] Give	the classification	and adva	ntages of	electro a	nalytical i	nethods.					
				C	R							
		r the followings:	sintian aa	natout fo		-:1	1		(6)			
(i [ii		rmination of dissoc calibration of glas				sic weak	pase.					
•				_								
Q.4 [a]	Differe	entiate between am	iperostati	ic coulom	etry and j	potentios	atic coul	ometry.	(6)			
[b]	Answe	r the followings:							(6)			
[i	curr anal resp	is titrated coulome ent of 10 mA. The p ytical is reacted for ect to NaOH, rentiate between d	point of e r 3 min. a	quivalenc and 10 se entiometr	e on the t ec. Calcul y and pot	itration o ate the ti	f 5 ml. of ter of HC	solution l I solution	oeing			
[b]		in brief on advant ve electrodes.	tages of p	ootentiom		ition and	applicat	ions of a	n ion (6)			
_	Q.5 [a] Answer the followings:  [i] Give the method to determine ionic product of water using conductometer.  [ii] Discuss about the cells used in high frequency conductance method and mention the advantages and disadvantages of high frequency titration.											
[b]	<ul> <li>[b] Write the principle of conductometric titration and discuss the following nature of curves with proper explanation:</li> <li>(1) Weak acid Vs. Strong Base (2) Weak acid Vs. Weak Base (3) Complexometric titration</li> </ul>											
n 1	7 -4			01		1701 1		0 137 37 6	OH in <b>(6)</b>			
[b]	[b] Let us consider that one is titrating 100 ml of 0.01N HCl solution with 0.1N NaO the cell whose cell constant is 1.0 cm <sup>-1</sup> , under this condition find out the conductation at (i) at the start (ii) after addition of 9 ml NaOH solution (iii) at the equivalence processes the conductation of the start (iii) after addition of 9 ml NaOH solution (iii) at the equivalence processes the conductation of the c											
	(iv) aft	er addition of 11m	l of the N	аОН. (λ <sub>н</sub> -	- = 350, ኢ	ci = 76, λ	$NR^{+} = 50,$	λ <sub>ΟΗ</sub> ¯ = 198	3)			
Q.6 [a]	Answe	r the followings:							(6)			
įi įii	quali	ain the basic pri tative and quantita an account of the	ative anal	lysis?				-	ul in			
[b]	Write	short note on:							(6)			
[i	] Titra	tion with Rotating	platinun	nicroele	ectrode.							
(ii	] Cycl	ic Voltametry.										
[b]	OR b] The following data were obtained on the rising portion of a polarographic wave for the reduction of 4.20 mM nitrate in DMF at 25 °C on the plateau of the polarographic wave. The drop time was 34.9 sec. for 10 drops and 20 drops had a mass of 0.1296											
	gm. The diffusion current was 14.25 $\mu A$ . Determine E $_{12}$ , n and D for nitrate in DMF. All current measurements were made at the top of the undamped records trace.											
		E vs. Ag/AgNO <sub>3</sub> (0.01M) V	-2.400	-2.420	-2.440	-2.460	-2.480	-2.460				
		i, μΑ	1.00	2.28	3,50	6.00	9.00	11.17				



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