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National Open University of Nigeria
Plot 91, Cadastral Zone, Nnamdi Azikiwe Expressway, Jabi – Abuja
Faculty of Science
2020_2 EXAMINATION

COURSE CODE: CHM413
COURSE TITLE: Analytical Chemistry II
CREDIT: 2 Units
TIME ALLOWED: 2 Hours
INSTRUCTION: Answer Question ONE (1) and any other Three (3) Questions

Question 1

1a) List and explain the two criteria that can be used to compare the results of titrimetric analysis **(5 marks)**

b) When is significance test employed in data analysis? **(4 marks)**

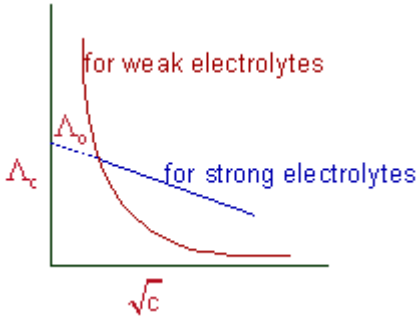
c) Mention four membrane materials, test ion and interfering ions **(6 marks)**

d) Write short notes on the following:

i) Electroanalytical chemistry **(2 marks)**

ii) Solid state membrane **(2 marks)**

e) Identify and hence discuss the plot below (**4 marks)**



f) Distinguish between a strong and a week electrolyte in terms of conductivity (**2 marks)**

Question 2

2 (a) what are the analytical methods required in thin layer chromatography? (**5marks)**

(b) Clearly discuss the separation processes involved in thin layer chromatography. (**5marks)**

(c) Explain in details flash column chromatography **(5 marks)**

Question 3

(a) Using graphs only represent linear sweep voltammetry and cyclic voltammetry **(5 marks)**

(b) What isotherms are used to describe the binding dynamics of a column chromatography?

(5 marks)

(c) What are the advantages of size-exclusion chromatography? **(5 marks)**

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Question 4

4) Nine measurements of H of a buffer solution gave the following results:
5.12, 5.20, 5.15, 5.17, 5.16, 5.19, 5.15, 5.01, 5.25
Calculate
i) Mean **(2 marks)**
ii) Median **(1 mark)**
iii) Standard deviation **(7 marks)**
iv) The 95% confidence limit for the experiment value. **(5 marks)**

Use the table below appropriately

Table 1.1 ; V a l u e s of t for confidence intervals

Degrees of freedom	Values of t for confidence interval of				
	80%	90%	95%	99%	99.9%
1	3.08	6.31	12.7	63.7	637
2	1.89	2.92	4.30	9.92	31.6
3	1.64	2.35	3.18	5.84	12.9
4	1.53	2.13	2.78	4.60	8.60
5	1.48	2.02	2.57	4.03	6.86
6	1.44	1.94	2.45	3.71	5.96
7	1.42	1.90	2.36	3.50	5.40
8	1.40	1.86	2.31	3.36	5.04
9	1.38	1.83	2.26	3.25	4.78
10	1.37	1.81	2.23	3.17	4.59

Question 5

a. Explain briefly the concept of precipitation as radioanalytical chemical technique. **(8 marks)**
b. Describe the basic principle of solvent extraction **(7 marks**

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