



NATIONAL OPEN UNIVERSITY OF NIGERIA
Plot 91, Cadastral Zone, Nnamdi Azikiwe Expressway, Jabi - Abuja
FACULTY OF SCIENCES
DEPARTMENT OF PURE & APPLIED SCIENCES
JULY 2017 EXAMINATION QUESTIONS

CHM413: Analytical Chemistry II

CREDIT UNIT: 2Units

TIME: 2 HOURS

INSTRUCTION: ANSWER QUESTION ONE & ANY OTHER THREE QUESTIONS.

QUESTION ONE

- a) List any two instruments used for making electrode potential measurements (2 marks)
- b) Define the term "error". (2 marks)
- c) Outline and discuss the various types of error. (10 marks)
- d) i) What do you understand by the terms "accuracy and precision". (1 mark)
ii. Differentiate between accuracy and precision. (2 marks)
- e) Thirteen measurements of the concentration of calcium in ground water samples gave the following results:
9.61, 9.76, 9.34, 10.98, 14.46, 12.16, 11.56, 17.77, 20.11, 13.90, 18.25, 16.55, 15.56
Calculate the:
 - i) Mean
 - ii) Median
 - iii) Standard deviation
 - iv) The 95% confidence limits for the true pH(8 marks)

QUESTION TWO

Explain briefly the classification of substances base on electrical conductivity (10 marks)

Highlight the steps involved in the preparation of a chromatographic column. (5marks)

Question 3

- a) Describe the basic components of a pH meter (5 marks)
- b) List and explain the factors that affect the conductivity of an electrolyte solution. (10marks)

Question 4

- a) Explain briefly the following terms:
 - i) retention time
 - ii) mobile phase
 - iii) chromatography
 - iv) analyte(10marks)
- b) Describe the operating principles of (i) Thin layer chromatography (TLC) and (ii) Column Chromatography. (5 marks)

Question 5

- a) List five basic applications of the differential scanning calorimeter. (5 marks)
- b) Explain the basic working principle of a Liquid Membrane Electrode. (10 marks)