



ALUPE UNIVERSITY
COLLEGE

Bastion of Knowledge...

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**OFFICE OF THE DEPUTY PRINCIPAL
ACADEMICS, STUDENT AFFAIRS AND RESEARCH**

UNIVERSITY EXAMINATIONS

2020 /2021 ACADEMIC YEAR

SECOND YEAR FIRST SEMESTER REGULAR EXAMINATION

FOR THE DEGREE OF BACHELOR OF EDUCATION SCIENCE

COURSE CODE: CHE 201

**COURSE TITLE: CHEMICAL ANALYSIS AND STRUCTURE
DETERMINATION**

DATE: 19/03/2021

TIME: 0900 – 1200 HRS

INSTRUCTION TO CANDIDATES

- SEE INSIDE

THIS PAPER CONSISTS OF 3 PRINTED PAGES

PLEASE TURN OVER

CHE 201: CHEMICAL ANALYSIS AND STRUCTURE DETERMINATION**STREAM: BED (Science)****DURATION: 3 Hours**

INSTRUCTIONS TO CANDIDATES

- i. Answer *ALL* questions.
- ii. Diagrams may be used whenever they serve to illustrate the answer

Question One

- a) Define the following terms;
 - i. Chemiometric (1 Mark)
 - ii. Spectroscopy (1 Mark)
 - iii. Accuracy (1 Mark)
 - iv. Precision (1 Mark)
- b) Discuss the objectives of analytical chemistry. (3 Marks)
- c) Outline the four basic steps followed in chemical analysis. (4 Marks)
- d) Briefly discuss the principles of ultraviolet-visible absorption. (4 Marks)
- e) Solutions of transition metal ions can be coloured, i.e., absorb visible light. Discuss. (4 Marks)

Question Two

- a) Outline the six key components of a basic atomic absorption spectroscopy. (6 Marks)
- b) Discuss the events that take place in FES when a metallic salt solution is aspirated into path of flame. (3 Marks)
- c) Define the term interferences as used in atomic absorption spectroscopy (2 Marks)
- d) Discuss the three types of non-spectral interferences (3 Marks)
- e) Discuss two possible solutions of chemical interferences (2 Marks)

Question Three

- * a) State two advantages of total consumption burner in flame emission spectroscopy (3 Marks)
- * b) State the three methods in flame spectroscopy (3 Marks)
- * c) Highlight the processes occurring in the flame while using flame emission spectrometer. (4 Marks)
- d) State two factors onto which concentration in turbidimetry depends. (2 marks)

- * e) Outline clinical applications of nephelometry (3 Marks)
- f) State the difference between IR band and Raman band. (3 Marks)

Question Four

- a) Outline the principles of fourier transform spectrophotometer (4 Marks)
- b) Differentiate between qualitative and quantitative Raman spectroscopy. (2 Marks)
- c) In turbidimetry, incident light entering the cuvette will be subjected to three reactions. Highlight them. (3 Marks)
- d) The principle of NMR usually involves two sequential steps. Discuss (4 Marks)
- e) What are the two major relaxation processes in magnetic spin. (2 Marks)
- f) What are the principles behind nephelometry (2 Marks)
