ALUPE UNIVERSITY COLLEGE
...Bastion of Knowledge...
P. O.Box 845-50400 Busia(K)
principal@auc.ac.ke
Tel: +254 741 217 185
+254 736 044 469
off Busia-Malaba road

OFFICE OF THE DEPUTY PRINCIPAL
ACADEMICS, STUDENT AFFAIRS AND RESEARCH

UNIVERSITY EXAMINATIONS

2018/2019 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: 13TH DECEMBER, 2018 **TIME: 9.00 AM – 12.00 PM**

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 from **SECTION A** and any other **THREE** questions from **SECTION B**.*

ii. *Diagrams may be used whenever they serve to illustrate the answer.*

iii. *Do not write on the question paper.*

SECTION A (24 MARKS)

Question One

a) Define the following terms;

i. Chemo-metric (1 Mark)

ii. Spectroscopy (1 Mark)

iii. Sensitivity (1 Mark)

iv. Accuracy (1 Mark)

v. Precision (1 Mark)

vi. Selectivity (1 Mark)

b) Discuss the objectives of analytical chemistry. (2 Marks)

c) Outline the four basic steps followed in chemical analysis. (4 Marks)

Question Two

a) Briefly discuss the principles of ultraviolet-visible absorption. (4 Marks)

b) Solutions of transition metal ions can be coloured i.e., absorb visible light. Discuss. (4 Marks)

c) State the minimum requirements of an instrument of study for absorption spectroscopy. (4 Marks)

SECTION B

Question Three

a) The principle of NMR usually involves two sequential steps. Discuss. (3 Marks)

b) Outline the six key components of a basic atomic absorption spectroscopy. (6 Marks)

c) Solutions of transition metal ions can be coloured. Discuss. (3 Marks)

Question Four

a) Define the term interference as used in atomic absorption spectroscopy. (2 Marks)

b) Discuss the three types of non-spectral interferences. (3 Marks)

c) Discuss two possible solutions of chemical interferences. (4 Marks)

d) State two advantages of total consumption burner in flame emission spectroscopy.(3 Marks)

Question Five

a) Outline the events that take place when a metallic salt solution is aspirated into path of flame in Flame Emission Spectroscopy, FES. (3 Marks)

b) Highlight the processes occurring in the flame while using flame emission spectrometer. (4 Marks)

c) In turbidimetry, concentration is dependent on two factors. State them. (2 Marks)

d) Outline clinical applications of Nephelometry. (3 Marks)

Question Six

a) Outline the normal instrumental process in FT-IR. (6 Marks)

b) State the three things that might happen to a particular molecule in the mixture injected into the column. (3 Marks)

c) Highlight two major relaxation processes. (3 Marks)

Question Seven

a) Give two clinical applications of turbidimetry. (3 Marks)

b) Briefly discuss the principle behind nephelometry. (3 Marks)

c) State the four criteria followed when selecting wavelength in nephelometry. (4 Marks)

d) Outline the mechanism of fluorescence and thermal emission. (2 Marks)

****