JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY

SCHOOL OF BIOLOGICAL, PHYSICAL, MATHEMATICS AND ACTUARIAL SCIENCES

UNIVERSITY EXAMINATION FOR THE DIPLOMA IN SCIENCE LABORATORY

1ST YEAR 2ND SEMESTER 2024

MAIN CAMPUS

COURSE CODE: SLD 1201

COURSE TITLE: CHEMISTRY TECHNIQUES III

EXAM VENUE: **STREAM: Diploma in Science Laboratory**

DATE: **EXAM SESSION:**

TIME: 2:00 HRS

Instructions:

1. **Answer question 1 (Compulsory) in Section A and ANY other 2 questions in Section B.**
2. **Candidates are advised not to write on the question paper.**
3. **Candidates must hand in their answer booklets to the invigilator while in the examination room**

SECTION A: COMPLUSORY (40 MARKS)

Question 1

1. Define the following terms as used in chemistry techniques;
   i. Potential difference [2 marks]
   ii. Electrolyte [2 marks]
   iii. Monochromator [2 marks]
   iv. Conductance [2 marks]
2. Describe any **THREE** applications of Atomic Absorption Spectroscopy. [6 marks]
3. Explain the working principle of a flame photometer and give any **TWO** of its applications. [6 marks]
4. Differentiate between proximate analysis and carbohydrates analysis. [4 marks]
5. Differentiate between an anode and a cathode as used in electrochemistry. [3 marks]
6. Differentiate between a bomb and ice calorimeter in terms of working principle. [4 marks]
7. List any **THREE** techniques used in analysis of metals. [3 marks]
8. State the role of the following components of an instrument; [6 marks]
   i. Detector
   ii. Nebulizer
   iii. Cuvette

Section B. Answer any <u>SIX</u> questions

Question 2 (10 marks)

a) There are **TWO** types of monochromators. Describe them. [4 marks]

b) Define the following terms as used in chemistry techniques; [6 marks]
   i. Emission
   ii. Atomization
   iii. Excitation

Question 3 (10 marks)

a) State the beer lamberts law. [2 marks]

b) Using examples differentiate between a weak and strong electrolyte. [4 marks]

c) Describe the process of electrolysis using a diagram. [4 marks]

Question 4 (10 marks)

a) Briefly describe the working principle of an atomic absorption spectrophotometer. [4 marks]

b) State any **THREE** uses of a bomb calorimeter in chemistry techniques. [6 marks]

Question 5 (10 marks)

a) State any **FOUR** importances of water treatment. [4 marks]

b) Describe any **THREE** applications of proximate analysis. [6 marks]

Question 6 (10 marks)

a) Discuss any **THREE** applications of fibre analysis. [6 marks]

b) Explain the working principle of a UV-visible spectrophotometer. [4 marks]

Question 6 (10 marks)

a) State any **FOUR** chemicals commonly used to purify water. [4 marks]

b) Describe any **THREE** applications of UV-visible spectrophotometer. [6 marks]

Question 7 (10 marks)

a) Discuss any **FIVE** stages of water treatment. [10 marks]

Question 8 (10 marks)

a) Define what a water treatment plant is composed of. [4 marks]

b) Comment on the **MAIN** objectives of a water treatment plant. [6 marks]

Question 9 (10 marks)

a) Differentiate between a ground state and excited state of an atom. [4 marks]

b) With regards to use of a machine, discuss any **THREE** relevance of calibration studies. [6 marks]

Question 10 (10 marks)

a) Describe how sample preparation is commonly done in the laboratory. [4 marks]

b) Briefly discuss **THREE** importance of use of instruments in chemical analysis. [6 marks]