



**JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY  
SCHOOL OF BIOLOGICAL, PHYSICAL MATHEMATICS AND ACTUARIAL SCIENCES  
BACHELOR OF EDUCATION (SCIENCE) WITH IT  
THIRD YEAR FIRST SEMESTER EXAMINATIONS**

**ECB 2331: SPECIAL METHODS OF TEACHING CHEMISTRY**

**UNIVERSITY EXAMINATIONS: 2023/2024 ACADEMIC YEAR**

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**EXAM VENUE:**

**STREAM: (BEd. Science)**

**DATE:**

**EXAM SESSION:**

**TIME: 2.00 HOURS**

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**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.**

**ANSWER ALL QUESTIONS IN SECTION A AND ANY TWO QUESTIONS IN SECTION B**

**SECTION A: ANSWER ALL QUESTIONS**

**QUESTION 1 (COMPULSORY) (30 MARKS)**

- a) Briefly outline the evolution of chemical equations [5 marks]
- b) Pedagogical skills necessary for effective teaching/learning of chemistry are underscored within three (3) domains namely; Cognitive, affective and psychomotor. Explain [5 marks]
- c) Below is **Form III** term one chemistry topics that should be taught for the first six (6) weeks. Outline a scheme of work that would help you as the subject teacher to deliver this content effectively. [20 marks]

**Topic 1: Boyle's law**

- ✓ Definition
- ✓ Equations and graphical representation
- ✓ Numerical questions
- ✓ Graph interpretation
- ✓ Interpretation of graphs

**Topic 2: Charles 'Law**

- ✓ Definition
- ✓ Equations and graphical representation
- ✓ Numerical questions
- ✓ Graph interpretation
- ✓ Interpretation of graphs

**Topic 3: Diffusion**

- ✓ Definition
- ✓ Rate of Diffusion
- ✓ Graham's Law
- ✓ Mathematical Representation of Graham's Law
- ✓ Numerical interpretation

**Topic 4: The Mole**

- ✓ RAM
- ✓ Number of moles in a substance
- ✓ RFM
- ✓ Moles and Avogadro's number
- ✓ Empirical formula
- ✓ Molecular formula
- ✓ Concentration of a solution
- ✓ Molarity of a solution
- ✓ Preparation of molar solutions
- ✓ Stoichiometry of a chemical solution

**Topic 5: Volumetric Analysis**

- ✓ Apparatus used in titrimetric analysis
- ✓ Titration process
- ✓ Basicity of an acid
- ✓ Standardization of HCl
- ✓ Redox Titration Reaction

## **QUESTION 2 (20 MARKS)**

- a. Outline a lesson plan that would be used for the sub-topic “**preparation of molar solutions**” [10 marks]
- b. Teaching/learning resources form an integral part of effective lesson delivery. Explain using **FIVE** counts [10 marks]

## **QUESTION 3 (20 MARKS)**

- a. Outline **FIVE** benefits of teaching processes and skills [10 marks]
- i. Retainability
  - ii. Attitude formation
  - iii. Flexibility
  - iv. Learning transfer
  - v. Value addition
- b. Outline FIVE pre-requisites for a successful class experiment. [10 marks]

## **QUESTION 4 (20 MARKS)**

- a. Briefly explain any **FIVE** psychosocial factors a Chemistry teacher should understand [10 marks]
- b. Briefly explain the storage, safety and use of Chemicals in a Chemistry Laboratory [10 marks]

## **QUESTION 5 (20 MARKS)**

- a. Explain the meaning of “**SMART**” objectives [10 marks]
- b. Outline any **FIVE** steps in problem solving [10 marks]

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