



MACHAKOS UNIVERSITY

University Examinations 2022/2023

SCHOOL OF EDUCATION

DEPARTMENT OF EARLY CHILDHOOD EDUCATION COMMUNICATION AND
TECHNOLOGY

DEPARTMENT OF EARLY CHILDHOOD EDUCATION

THIRD YEAR FIRST SEMESTER EXAMINATION FOR

BACHELOR OF EDUCATION (SCIENCE)

ECT305: CHEMISTRY METHODS

DATE:

TIME:

INSTRUCTIONS

Answer Question ONE and ANY OTHER TWO.

1.
 - (a) Explain how you would develop practical skills in a named chemistry topic, using the VEE-DIAGRAM. (10 marks)
 - (b) Prepare an 80-minute Lesson Plan for a practical activity on test for Cations. In your lesson plan, assume that you will have access to:
Sodium Hydroxide solution; Ammonium Hydroxide Solution; Solutions containing: Sodium I Ions; Iron III Ions; Aluminium III Ions; Copper II Ions; Zinc II Ions; Lead II Ions. (10 marks)
 - (c) Prepare a table of expected observations and correct inferences for each of the Cations: *Iron III Ions; Aluminium III Ions; Copper II Ions; Zinc II Ions; Lead II Ions* in:
 - (i) *Sodium Hydroxide solution.* (5 marks)
 - (ii) *Ammonium Hydroxide Solution.* (5 marks)

2. (a) Explain and Illustrate the FIVE STEPS involved in the development of a balanced Test in Chemistry. (10 marks)
- (b) Explain the procedure, reagents, observations and inferences related to The Confirmatory Tests for the following Anions:
- | | | |
|-------|---|-----------|
| (i) | SO_4^{2-} , SO_3^{2-} | (4 marks) |
| (ii) | Cl^- | (3 marks) |
| (iii) | NO_3^{1-} | (3 marks) |
3. (a) Explain and illustrate FIVE Practical Skills tested in each of the following areas of Chemistry Practical:
- | | | |
|-------|-----------------------|-----------|
| (i) | Volumetric Analysis. | (5 marks) |
| (ii) | Qualitative Analysis. | (5 marks) |
| (iii) | Enthalpy Change. | (5 marks) |
| (iv) | Rates of Reaction. | (5 marks) |
4. Select a topic from the Secondary School Chemistry Syllabus and explain how you would teach it using ONE of the following approaches: mention the key learning objectives; organization of learning activities; teaching aids and evaluation criteria for successful learning. (20 marks)
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|-------|-----------------------------|
| (i) | The Inquiry Based Learning. |
| (ii) | The Project Method. |
| (iii) | The Discussion Method. |
| (iv) | Field Trip Method. |
| (v) | The Learning Cycle. |

5. Write a Critical Essay on ONE of the following aspects of CHEMISTRY. (20 marks)

- (i) Chemistry and industrial development in Kenya.
- (ii) Chemistry and Career opportunities.
- (iii) Chemistry and Medicine.
- (iv) Project Work and the teaching of Chemistry.
- (v) Chemistry and the National Congress for Science and Technology.