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(Knowledge for Development)

KIBABII UNIVERSITY

**UNIVERSITY EXAMINATIONS
2020/2021 ACADEMIC YEAR
THIRD YEAR FIRST SEMESTER
MAIN EXAMINATION**

**FOR THE DEGREE OF BACHELOR OF EDUCATION
(SCIENCE)**

COURSE CODE: ESM 313

COURSE TITLE: CHEMISTRY EDUCATION

DATE: 16/07/2021

TIME: 9:00AM-11:00PM

INSTRUCTIONS TO CANDIDATES

Answer Question One and any other TWO Questions

TIME: 2 Hours

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Question One (30 Marks)

Practical work is an important strategy for teaching chemistry at secondary school level

- a) Discuss the main objectives of practical work at secondary school? (6 marks)
- b) The scientific method of teaching advocates learning which proceeds from concrete to abstract. How does practical work contribute to this? (6marks)
- c) Give **three** reasons why you would elect to use a class demonstration in place of a class experiment? (6 marks)
- d) A chemistry teacher can improvise some quality resources when teaching the topic 'Hydrocarbons'. Using examples, discuss this statement (8 marks).
- e) Give two disadvantages of using practical work as a teaching strategy (4 marks)

Question Two (20 Marks)

Proper storage of chemicals is important in a chemistry laboratory

- a) Explain how the following information could help you in the storage of chemicals
 - i. Quantity (size) of chemicals (3marks)
 - ii. Flash points (i.e.) (3 marks).
- b) (i) Explain how the flexible laboratory design is said to be more effective than the traditional design in facilitating practical chemistry instruction (6 marks).
(ii) Why is the gas room often positioned outside the main laboratory? (2 marks)
- c) Briefly outline **three** elements that must be observed in the design of school projects in chemistry (6 marks)

Question Three (20 Marks)

Resources in chemistry can be expensive for many county schools. One method of helping such schools is introduction of science micro-kits.

- a) Outline any **six** advantages of using science micro-kits in teaching chemistry (6 marks)
- b) Improvisation of locally available resources is a one of the common methods used in alleviating the problem in 3 (a) above.
 - i) Briefly outline how would you teach the topic of electrolysis, using locally available resources (8 marks)
 - ii) A laboratory is expected to facilitate the development of manipulative skills among learners. Explain the main role of manipulative skills in a practical lesson (6marks)

Question Four (20 Marks)

In relation to Assessment at school level, explain the following;

- i. KNEC uses two papers to test theoretical chemistry (6 marks)
- ii. Learners find the mole concept difficult to understand (3 marks)
- iii. outline how you would teach the mole, by demystifying this notion in a chemistry lesson? (5 marks).
- iv. Suppose you were to carry out a teacher demonstration on “the preparation of chlorine gas” to a form three class. Give three reasons why you would perform a teacher demonstration (6 marks).

Question Five (20 Marks)

In reference to laboratory safety, explain the importance of the following;

- i. Keeping a proper record of incidents in a chemistry laboratory (3 marks)
- ii. Using a fume chamber in preparing ammonia gas (3 marks).
- iii. A fire triangle is the basis for managing fires in a chemistry laboratory (6 marks).
- iv. Explain why it is not advisable to administer a bandage as first aid on any burn (3 marks).
- v. Describe the first aid measure that you would administer on a common acid burn in a laboratory, before referring a learner for specialized treatment (5 marks).