



MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY

P.O. Box 972-60200 – Meru-Kenya

Tel: +254(0) 799 529 958, +254(0) 799 529 959, + 254 (0) 712 524 293,

Website: info@must.ac.ke Email: info@must.ac.ke

University Examinations 2023/2024

FIRST YEAR SECOND TRIMESTER EXAMINATION FOR THE DIPLOMA IN
ENVIRONMENTAL SCIENCE AND TECHNOLOGY

SHC 2151: LABORATORY PRACTICE AND TRENDS

ATE: APRIL 2024

TIME: 3 HOURS

INSTRUCTIONS

1. This paper has two sections **A** and **B**.
2. You are provided with separate answer booklet.
3. Marks for each question are as indicated.
4. **Do not write** on the question paper.

SECTION A [40 Marks]

Answer any **All** questions in this section

1. First aid is the immediate assistance or care given to a person who has been injured or suddenly taken ill. Outline **four** importance of first aid. (4 Marks)
2. A first aid box contains tools that can be used to administer first aid in the case of an emergency. Describe any **four** contents of a first aid box (4 Marks)
3. Laboratory reagents are crucial in various chemical reactions and tests, serving diverse purposes. Highlight **two** types of laboratory reagents (4 Marks)
4. Highlight **two** quality requirements to be met by laboratory reagents (4 Marks)
5. All chemicals used in laboratory have safe handling methods as specified by chemical's label and Material Safety Data Sheet (MSDS). Enumerate **four** general guidelines when handling chemicals (4 Marks)

6. Reagents that are stored properly maintain have a much longer shelf life and maintain their maximum effectiveness than those that are improperly stored. List **four** methods of proper storage of reagents (4 Marks)
7. List **four** ways to care for reagents during storage (4 Marks)
8. Differentiate between stock solution and working solution (4 Marks)
9. Calculate the volume of a stock solution for an experiment which needs you to prepare 75 milliliters of a 2.2 M working solution from a 15 M stock solution. (4 Marks)
10. Apart from calculation, suggest any other **four** steps/guide followed to prepare stock solutions (4 Marks)

SECTION B (60 Marks)

Answer any **Three** questions in this section

11. A laboratory is a special room where practical sessions are carried out for learning purposes. Discuss;
 - a) **Five** role of lab supervisor/technologist (10 Marks)
 - b) The basic structure/sections of a lab report (10 Marks)
12. In a laboratory setting, injuries and poisoning can occur due to several accidents/mistakes.
 - a) Explain **four** types of injuries that can occur in the lab (8 Marks)
 - b) Analyze **three** methods/means of lab poisoning (6 Marks)
 - c) Discuss **three** ways of treating lab poisoning (6 Marks)
13. Housekeeping refers to the general condition and appearance of a laboratory. Discuss;
 - a) Any **five** Housekeeping for Glassware and Sharp objects (e.g., needles and blades) (10 Marks)
 - b) Any **five** Housekeeping for Electrical Equipment (10 Marks)
14. Chemical reagents are substances used in chemical reactions to bring about a desired transformation in the reactants.
 - a) Explain **five** common types of chemical reagents and their uses (10 Marks)
 - b) Discuss **five** factors that are used to grade reagents (10 Marks)