



# MERU UNIVERSITY OF SCIENCE & TECHNOLOGY

Qualification: **Diploma In Environmental Science & Technology Level 6**

Unit of Competency: **Laboratory Safety & Instrumentation**

Unit Code: **SHC 2150**

**April 2024**

## END OF SEMESTER WRITTEN ASSESSMENT

**Time: 3 Hours**

### INSTRUCTION TO CANDIDATES

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

**This paper consists of 3 printed pages**

**Candidates should check the question paper to ascertain that all pages are printed as indicated and that no questions are missing**

### SECTION A [40 Marks]

Answer **all** questions in this section

1. Laboratory layout and design refer to the planning and arrangement of a laboratory space to optimize functionality, efficiency, safety, and workflow. Highlight **four** key elements of laboratory layout and design (4 Marks)
2. List **Four** housekeeping for electrical equipment in the lab (4 Marks)
3. Highlight **five** laboratory equipment used for learning (5 Marks)
4. Describe the **five** types of fire extinguishers used in the lab for fire emergency situations (5 Marks)
5. Vibration impacts come from a variety of sources, all of which should be strategically designed and planned for in all labs. Explain **two** sources of vibrations in the lab (4 Marks)
6. Describe two effects of vibrations on equipment (4 Marks)
7. Discuss **two** methods of overcoming vibrations in the lab (4 Marks)
8. List four types of laboratories found within Meru University of Science & Technology (4 Marks)
9. Describe two types of water drainage systems found within biological sciences laboratory at MUST (4 Marks)
10. State two examples of natural ventilations used in the laboratories

### SECTION B (60 Marks)

Answer any **three** questions in this section

11. A laboratory is a controlled environment where scientists manipulate variables, ensuring accurate and reproducible experiments.
  - a) Discuss **five** importance of laboratories in environmental studies (10 Marks)
  - b) Explain **five** types of laboratories within the wider learning environment (10 Marks)
12. Laboratory layout and design is affected by a number of factors and features.
  - a) Describe **four** factors that affect laboratory layout and design (12 Marks)
  - b) Discuss four laboratory fittings (8 Marks)

13. Laboratories are essential to scientific research and experimentation, but they can also be dangerous places if proper safety precautions are not taken.

a) Analyze **five** main sources of danger/hazards in the laboratory (10 Marks)

b) Explain **five** safety features in the laboratory (10 Marks)

14. A standard list of basic laboratory safety rules are usually given and must be followed in every laboratory that uses hazardous materials or processes. These basic rules provide hygiene and behavior safety information to avoid accidents in the laboratory.

a) Enumerate **five** basic laboratory safety rules (10 Marks)

b) Summarize **five** general housekeeping practices in the lab (10 Marks)

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🌀ALL THE BEST🌀