

073105T4PLM

PLUMBING LEVEL 5

CON/OS/PL/CR/03/5/

Install Drainage System

November/December 2025



**TVET CURRICULUM DEVELOPMENT, ASSESSMENT AND CERTIFICATION
COUNCIL (TVET CDACC)**

WRITTEN ASSESSMENT

TIME: 3 HOURS

INSTRUCTIONS TO CANDIDATE

1. This paper consists of **TWO** sections: **A** and **B**.
2. Answer **ALL** questions in section A and **ANY THREE** (3) questions in section B.
3. Marks for each question are indicated in the brackets.
4. Candidates are provided with a separate answer booklet
5. Do not write on the question paper.

This paper consists of FOUR (4) printed pages

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

SECTION A (40 MARKS)

Attempt ALL the questions in this section.

1. The right pipe material ensures a strong and lasting drainage system. Name four common materials used for pipes in drainage system installations. (4 Marks)
2. Proper care and storage of drainage tools ensure safety, enhances efficiency, prolongs tool life, and reduces unnecessary replacement costs. State FOUR correct practices for caring and storing drainage tools in line with workplace policy. (4 Marks)
3. Joint positions are carefully marked during setting out to ensure the system's durability. State FOUR consequences of failing to identify joint positions correctly when setting out a drainage system. (4 Marks)
4. Every stage of pipe installation must be guided by proper health and safety practices to ensure smooth progress and compliance with standards. State FOUR health and safety practices to observe when laying below-ground drainage pipes. (4 Marks)
5. Define the following terms as used in Plumbing:
 - a) Pipe gradient: (2 Marks)
 - b) Invert levels: (2 Marks)
6. Working drawings play a vital role during execution of plumbing works. List FOUR importance of working drawings in plumbing projects. (4 Marks)
7. Symbols are simplified drawings used on plans. State FOUR reasons why standard plumbing symbols are used in working drawings. (4 Marks)
8. Blocked drains are a common plumbing issue that can disrupt sanitation and cause flooding, hence effective clearing methods are essential to restore proper flow. List FOUR methods of clearing blocked drains. (4 Marks)
9. Market research is an essential step that influences both cost control and quality assurance in plumbing projects. State FOUR benefits of obtaining market rates before purchasing drainage materials. (4 Marks)
10. Wastewater carries contaminants that can directly affect the health and safety of workers if precautions are not observed. Identify FOUR health risks plumbers may face when handling wastewater. (3 Marks)

SECTION B (60 MARKS)

Attempt THREE questions in this section.

11. Identifying and preventing blockages, protecting laid pipes, and observing environmental considerations are essential for ensuring safe, durable, and environmentally friendly drainage systems.
- a. List SIX common causes of blockages in drainage systems. (6 Marks)
 - b. Explain FOUR ways of protecting laid below-ground drainage pipes from damage. (8 Marks)
 - c. Explain THREE environmental considerations to observe during drainage installation in line with NEMA guidelines. (6 Marks)
12. Before drainage construction begins, the measurements from the working drawings must be accurately transferred to the ground.
- a) Explain the FIVE steps of transferring drainage measurements from a drawing to the actual ground. (10 Marks)
 - b) A drainage line is designed at a gradient of 1:40. Calculate the invert level difference over a 20m length of pipe. (4 marks)
 - c) Accurate costing ensures that plumbing projects remain within budget and that appropriate quality materials are selected. Explain THREE factors that influence the cost of drainage materials. (6 Marks)
13. Below-ground drainage pipes must be adequately protected to ensure durability, prevent leakage, and maintain the efficiency of the drainage system
- a) State FIVE requirements of a good below-ground drainage system. (5 Marks)
 - b) Describe FIVE common causes of pipe failures in below-ground drains. (10 Marks)
 - c) Unblocking drains involves risks which require adhering to safety precautions to ensure the health and protection of workers and the public. State FIVE safety precautions when unblocking drains. (5 Marks)
14. Efficient drainage systems rely on properly designed access points and protective fittings to ensure smooth flow.
- a) Describe FOUR functions of manholes in a drainage system. (8 Marks)
 - b) Justify FOUR reasons why gully traps are utilized in a surface water drainage system. (8 Marks)

- c) Identify FOUR environmental problems caused by poor surface water drainage giving possible solutions. (4 Marks)

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