

073204T4PLM

PLUMBING LEVEL 4

CON/OS/PL/CR/02/4/A

Install Rainwater Harvesting Systems

Nov/Dec 2024



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

WRITTEN ASSESSMENT

Time: 2 HOURS

INSTRUCTIONS TO CANDIDATE

1. This paper consists of two sections; **A** and **B**
2. Answer **ALL** the question as guided in each section
3. Marks for each question are as indicated in the brackets
4. You are provided with a separate answer booklet to answer the questions
5. Do not write in this question paper

This paper consists of FIVE (5) 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 (10 MARKS)

Answer all questions in this section. Each question carries one mark

1. Working drawing provide details of the layout and specifications required for installation of rainwater harvesting. When interpreting a working drawing, what does a solid line typically represent?
 - A. A proposed pipe layout.
 - B. An existing structure.
 - C. A vent pipe.
 - D. An electric conduit.
2. Accurately calculating the quantity of materials is crucial for a successful rainwater harvesting project. Which factor is most important when determining the size of the storage tank needed for a rainwater harvesting system?
 - A. The amount of rainfall.
 - B. The color of the tank.
 - C. The type of roof material.
 - D. The distance to the nearest water source.
3. Estimating materials quantities help in budgeting and ensure all necessary supplies are available on-site. If a roof top area measures 100 square meters and the average rainfall is 1,000mm per year, what is the approximate amount of water that can be harvested annually?
 - A. 10,000 litres.
 - B. 50,000 litres.
 - C. 100,000 litres.
 - D. 1,000,000 litres.
4. Installing rainwater harvesting materials correctly is crucial for the system efficiency and longevity. What is the primary purpose of a first flush diverter in a rainwater harvesting system?
 - A. To prevent debris from entering the storage tank
 - B. To increase water pressure
 - C. To filter bacteria from the water
 - D. To reduce noise from the system

5. Proper installation techniques ensure the rain water harvesting system functions effectively. During installation, why is it important to ensure that gutters are properly sloped?
 - A. To prevent leaks.
 - B. To ensure water flows towards the downspout.
 - C. To make the system visually appealing.
 - D. To reduce installation time.
6. Testing the rain water harvesting system is necessary to ensure it operates as intended. Which of the following is the most effective way to test the efficiency of a rainwater harvesting system after installation?
 - A. Check for water discoloration.
 - B. Measure the water pressure in the taps.
 - C. Simulate rainfall using a hose.
 - D. Inspect the tanks structural integrity.
7. Regular testing of water harvesting goods helps in identifying and rectifying issues before they become major problems. What should be the first step in testing a newly installed rainwater harvesting system?
 - A. Fill the storage tank with water.
 - B. Inspect all connection for leaks.
 - C. Install a water filtration system.
 - D. Measure the tanks capacity.
8. Proper housekeeping practices are vital to maintain a safe and efficient working environment. Which activity is considered a good housekeeping practice on a construction site during gutter installation?
 - A. Leaving tools scattered around
 - B. Properly storing materials and tools after use
 - C. Disposing of waste in the work area
 - D. Ignoring minor spills
9. The installation of rainwater harvesting system is a vital component for sustainable plumbing practices. The following are the key steps in installation of rainwater harvesting system except.

- A. Conducting site assessment.
 - B. Installation of gutters and downpipes.
 - C. Setting up the storage tank.
 - D. Painting the roof to make it clean and neat.
10. When installing rainwater harvesting systems, wearing the correct PPE is essential to protect yourself from potential hazards. Which PPE is most important when working on a roof to install gutters and downpipes?
- A. Hard hat
 - B. Safety harness
 - C. Earplug
 - D. Respirator

SECTION B (40 MARKS)

Answer ALL questions in this section.

11. Interpretation of working drawing helps one to come up with the clear image of what should be done. How can a working drawing help in determining the slope required for gutters in a rainwater harvesting system? (1 Mark)
12. Accurate interpretation ensures correct installation, material quantification, and system efficiency. List FOUR key components of rainwater harvesting system that should be identified on a working drawing? (4 Marks)
13. Proper installation of water harvesting goods is vital for the systems efficiency. What are THREE methods of securing gutters to ensure proper water flow in a rainwater harvesting system? (3 Marks)
14. Performing functionality tests on gutter system ensures that the system operates efficiently and meets required standards. What are THREE major tests for gutter leaks? (3 Marks)
15. The rainwater harvesting is the process involving capturing, storing and distributing rain water for non-portable uses. Give THREE factors to consider when selecting a rainwater storage tank. (3 Marks)

16. Accurate measurement and installation of water goods are key to ensuring the efficiency of rainwater harvesting system. State TWO ways in which the size of the storage tank is determined for a residential rainwater harvesting system? (2 Marks)
17. Filters installed on rainwater harvesting systems are important for maintaining clean water quality. What are the FOUR functions of a first-flush diverter during water harvesting? (4 Marks)
18. One of the key advantages of installing rainwater harvesting system is to conserve water as a valuable resource. How does a rainwater harvesting system contribute to water conservation in residential areas? (5 Marks)
19. Proper use of tools ensures that components of a rainwater harvesting system are installed to the correct specification. Name THREE tools commonly used in rainwater harvesting? (3 Marks)
20. Rainwater harvesting goods are used for carrying water away from a building to prevent it from entering the building fabric. These rainwater goods are made up of different materials. State FIVE properties of a good rainwater harvesting system. (5 Marks)
21. A gutter plays an important role in the harvesting of rainwater for storage. Give FOUR main gutters profiles that are used in harvesting rainwater. (4 Marks)
22. Fittings are used in various capacities during rainwater goods installation. Name the following types of fittings as used in rainwater harvesting. (3 Marks)



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