©2025 TVET CDACC

073105T4PLM

PLUMBING LEVEL5

CON/OS/PL/CM/03/5

Apply Scientific Principles

November/December 2025

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

WRITTEN ASSESSMENT

easyfvet.com

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 THREE (3) 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 questions from this section

1. Friction plays a key role in enabling movement and control in mechanical and human activities**.** State FOUR advantages of friction in daily life. (4 Marks)
2. Recognizing sources of heat is important for understanding how energy is transferred and applied in both household and industrial activities. List FOUR sources of heat. (4 Marks)
3. Understanding density is important in everyday life. List FOUR applications of density in real life. (4 Marks)
4. Energy takes different forms based on whether matter is in a solid, liquid, or gaseous state, aiding its practical transformation and use. Outline FOUR forms of energy based on the state of matter. (4 Marks)
5. Observing safety practices when dealing with electrical systems is vital in plumbing work List FOUR occupational safety practices plumbers should observe when handling electrical systems on site. (4 Marks)
6. Sound sources vary from natural to artificial, and understanding them is key in acoustics and communication systems. List FOUR sources of sound. (4 Marks)
7. A plumber is dragging a GI Pipe across a building. Calculation the work done if a force of 20 N is applied in moving the pipe at a horizontal distance of 5 m. (4 Marks)
8. Fluid pressure laws are essential in designing hydraulic systems and understanding natural fluid behaviors. State FOUR laws of pressure in fluids. (4 Marks)
9. Recognizing the effects of force is important in understanding how objects respond in the physical world. Give FOUR effects of force on a body. (4 Marks)
10. $250cm^3$ of fresh water of density $1000kg/m^3$ is mixed with $300cm^3$ juice density $1250kg/m^3$.Calculate the density of the mixture. (4 Marks)

easyTVET.com

SECTION B: 60 MARKS

Attempt THREE questions from this section

11. The study of fluid pressure is vital in designing safe water supply systems, hydraulic machines, and structural works that withstand pressure variations.
    a) A tank holds water to a depth of 4 m. If the density of water is 1000 kg/m³. Calculate the pressure at the base of the tank. (2 Marks)

    b) Describe FIVE applications of Pascal's principle. (10 Marks)
    c) Explain FOUR reasons why dams are built thicker at the bottom than at the top. (8 Marks)
12. Mechanical properties determine how materials behave under load, guiding engineers in material selection for durability, safety, and performance.
    a) List FOUR mechanical properties of materials tested in engineering. (4 Marks)
    b) Explain FOUR reasons why steel is preferred in structural works compared to cast iron. (8 Marks)
    c) Describe FOUR elastic materials, stating their area of application in daily life. (8 Marks)

easyfivet.com

13. Knowledge of force and energy principles forms the foundation for analyzing motion, machine performance, and energy transformations in practice.
    a) Explain Newton's THREE laws of motion. (6 Marks)
    b) Explain FOUR real life examples on law of conservation of energy. (8 Marks)
    c) A training simulator shows a wheel and axle used to lift a load. The wheel has a diameter of 80 cm, and the axle has a diameter of 20 cm. A load of 400 N is lifted when an effort of 150 N is applied at the wheel. Determine the Velocity Ratio (VR) if the efficiency of the system is 75%. (6 Marks)
14. Managing friction appropriately allows engineers to balance safety, control, and efficiency in both machines and daily applications
    a) Explain THREE differences between static and dynamic friction, giving TWO examples for each. (10 Marks)
    b) Explain FOUR methods of increasing friction where it is useful. (8 Marks)
    c) Outline TWO reasons why ball bearings are utilized in rotating machinery. (2 Marks)