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PLUMBER LEVEL 5

CON/OS/PL/CR/01/5/A

INSTALL WATER SUPPLY SYSTEMS

July/August 2024

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

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WRITTEN ASSESSMENT

3 HOURS

Instructions to Candidate

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

This paper consists of FOUR (4) 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. Plumbing installations involve setting up systems for transporting water, gas, and waste in buildings. This includes water supply lines, drainage systems, and gas supply lines. Differentiate between a tap and a valve as used in plumbing installations. (2 Marks)
2. In plumbing installations, various faults can occur that may compromise the system's functionality, efficiency, and safety. List FOUR faults present in arc welded joints. (4 Marks)
3. Personal Protective Equipment (PPE) is essential for ensuring the safety and health of individuals working in various environments, particularly in industries like construction, healthcare, manufacturing, and plumbing. List THREE personal protective equipment used in plumbing, giving the use of each. (3 Marks)
4. Plumbers need a variety of specialized tools to install, maintain, and repair plumbing systems. State the use of each of the following:
   a. Threading tape. (1 Mark)
   b. Pipe wrench. (1 Mark)
   c. Pipe vice. (1 Mark)
5. Pipes are the backbone of any plumbing system, carrying water, gas, and waste to and from buildings. Sketch the following pipe supports:
   a. Saddle clip. (2 Marks)
   b. Pipe hanger. (2 Marks)
6. In plumbing, having the right tools is essential for performing various tasks efficiently and safely. Highlight TWO precautions when using each of the following tools:
   a. Chisel. (2 Marks)
   b. Hacksaw. (2 Marks)
7. Effective housekeeping practices in any setting, whether it be residential, commercial, or industrial, are essential for maintaining a clean, safe, and efficient environment. State FOUR housekeeping practices that should be adhered to during pipework. (4Marks)
8. Understanding flow in pipes is fundamental to designing, installing, and maintaining efficient plumbing systems. Explain the following flows in pipes:
   a. Laminar flow. (2 Marks)

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b. Turbulent flow. (2 Marks)

9. A single stack pipe system, also known as a single-stack drainage system, is a plumbing system commonly used in high-rise buildings, where all waste and soil pipes are connected to a single vertical stack that runs through the building and connects to the main sewer or septic tank. State FOUR design requirements of a single stack pipe system. (4 Marks)
10. Leakage in pipework can lead to water damage, structural issues and increased utility bills. State FOUR causes of leakage in pipework. (4 Marks)
11. Joints in pipes are where two or more sections of piping are connected together. Give FOUR functions of a joint in pipes. (4 Marks)

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SECTION B: (60 MARKS)

*Answer any **THREE** questions in this section.*

12. Testing pipework is a crucial step in plumbing installation to ensure that the system is leak-free, structurally sound, and compliant with regulations.
    a. Describe an air test as used to test the functionality of pipework. (4 Marks)
    b. Highlight the procedure of hot bending a PVC pipe. (8 Marks)
    c. With the aid of sketches explain how a PVC solvent joint is done. (8 Marks)
13. Welding is a versatile and widely used process for joining materials in various industries. By understanding different welding types, techniques, equipment, and safety considerations, welders can produce high-quality welds efficiently and safely.
    a. Differentiate between leftward and rightward gas welding techniques. (6 Marks)
    b. Sketch and label a flange joint on a mild steel pipe. (5 Marks)
    c. Give the THREE types of mild steel pipes, giving the color code and one use of each of them. (9 Marks)
14. Threaded pipes are commonly used in plumbing and piping systems for their ease of installation and disassembly. Describe the procedure of cutting threads on a steel pipe using a stock and die. (20 Marks)
15. A vented pipe system, also known as a drainage or plumbing vent system, is an integral part of plumbing systems designed to facilitate the flow of wastewater while preventing the buildup of pressure, siphoning of water from traps, and the release of foul odors into buildings. Sketch and explain a fully vented one pipe system to a two-storey building serving three appliances on each floor. (20 Marks)

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