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higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

# NATIONAL CERTIFICATE

# PLUMBING THEORY N1

(11022041)

**22 November 2019 (X-Paper)**
**09:00–12:00**

**This question paper consists of 5 pages.**

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# DEPARTMENT OF HIGHER EDUCATION AND TRAINING
# REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE
PLUMBING THEORY N1
TIME: 3 HOURS
MARKS: 100

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**INSTRUCTIONS AND INFORMATION**

1. Answer ALL the questions.
2. Read ALL the questions carefully.
3. Number the answers according to the numbering system used in this question paper.
4. Sketches must be large, neat and fully labelled.
5. ALL abbreviations and symbols must comply with the latest National Building Regulations and ALL relevant SANS-codes.
6. $g = 10\ m/s^2$.
7. Write neatly and legibly.

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## QUESTION 1: SAFETY AND HOUSEKEEPING

Name the FOUR main categories and shapes of safety signs. (4 × 2) **[8]**

## QUESTION 2: TOOLS AND MACHINES

2.1 Name FIVE measuring and marking tools. (5)

2.2 Make a sketch of a pair of general-purpose pliers. (5)
**[10]**

## QUESTION 3: METALS AND MATERIALS

Write each of the following abbreviations in full:

3.1 Cu

3.2 PVC

3.3 GMS

3.4 Pb

(4 × 2) **[8]**

## QUESTION 4: SOLDERING AND WELDING

4.1 Explain each of the following:

4.1.1 Arc welding

4.1.2 Gas welding

(2 × 2) (4)

4.2 State FOUR safety precautions that should be adhered to when the oxy-acetylene welding apparatus is used. (4)
**[8]**

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## QUESTION 5: COLD-WATER SUPPLY

5.1 Name TWO tools that may be used to cut copper pipes. (2)

5.2 List the steps to follow to assemble copper pipework with a capillary joint. (8)

5.3 Name THREE types of plastic pipes. (3)

5.4 Briefly explain the procedure to follow when using galvanised mild-steel pipes. (5)

**[18]**

## QUESTION 6: HOT-WATER SUPPLY

6.1 Name THREE types of active solar water-heating systems. (3)

6.2 Give FOUR advantages of a combination geyser. (4)

6.3 What are the pressure ratings for geyser pressure-relief valves with the following colour codes:

6.3.1 Black

6.3.2 Orange

6.3.3 Blue

6.3.4 Red

6.3.5 Yellow

(5 × 1) (5)

**[12]**

## QUESTION 7: DRAINAGE

7.1 Why is it not necessary for a water closet to be fitted with a water-seal trap? (2)

7.2 Make a sketch to illustrate a vertical section through a wash-down water closet (P-trap). (5)

7.3 List FOUR ways to install or fit taps or a mixer to a basin. (4)

7.4 Name TWO types of urinals normally installed at communal ablutions. (2)

7.5 Explain the difference between a *rodding eye* and an *inspection eye.* (2 + 2) (4)

7.6 Explain the term *sewage*. (2)

**[19]**

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## QUESTION 8: SHEET-METAL WORK

8.1 Name THREE methods used in sheet-metal work to develop patterns. (3)

8.2 What is a *chimney flashing*? (2)

8.3 Name the THREE parts of a chimney flashing. (3)

8.4 Why do box gutters usually not require gutter brackets? (2)
**[10]**

## QUESTION 9: CALCULATIONS

Calculate the total pressure on the bottom of a cold-water supply tank 6 metres long by 4 metres wide and filled up with water to a height of 3 metres. **[7]**

**TOTAL: 100**

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