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higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

# NATIONAL CERTIFICATE

# PLUMBING THEORY N1

(11022041)

**29 November 2023 (X-paper)**
**09:00–12:00**

**Drawing instruments and nonprogrammable calculators may be used.**

**This question paper consists of 6 pages.**

156Q1E2329

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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. Start each section on a new page.
5. Use only a black or a blue pen.
6. Write neatly and legibly.

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## QUESTION 1: SAFETY AND HOUSEKEEPING

1.1 Explain what is meant by good housekeeping. (1)

1.2 State TWO advantages of collapsible steel trestles. (2)

1.3 To maintain the safe use of ladders, give ONE example of how to take care of a ladder and ONE example of how a ladder can be stored safely. (2)
**[5]**

## QUESTION 2: TOOLS AND MACHINES

2.1 What is the purpose of a groover? (1)

2.2 Name TWO types of pipe vices used by plumbers. (2)

2.3 Explain TWO uses for each of the following machines:

2.3.1 Rolling machines

2.3.2 Hand lever shears

2.3.3 Jenny

(3 × 2) (6)

2.4 Explain why cutting oil is continuously pumped onto a pipe a thread is cut on the pipe with a threading machine. (1)
**[10]**

## QUESTION 3: METALS AND MATERIALS

3.1 Name ONE type of solder for soldering sheet metal work and state its composition. (1)

3.2 Briefly explain how an electrolytic reaction occurs in water pipes. (3)

3.3 Name the metal that is used for the manufacturing of soldering iron points/heads and state TWO characteristics thereof. (4)
**[8]**

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## QUESTION 4: SOLIDERING AND WELDING

4.1 Describe the arc welding process. (3)

4.2 Explain the difference between the following flames with regard to gas mixtures:

4.2.1 Neutral flame

4.2.2 Carburising flame

4.2.3 Oxidising flame

(3 × 1) (3)

4.3 State TWO safety precautions that should be adhered to when oxy-acetylene welding apparatus is used. (2)

**[8]**

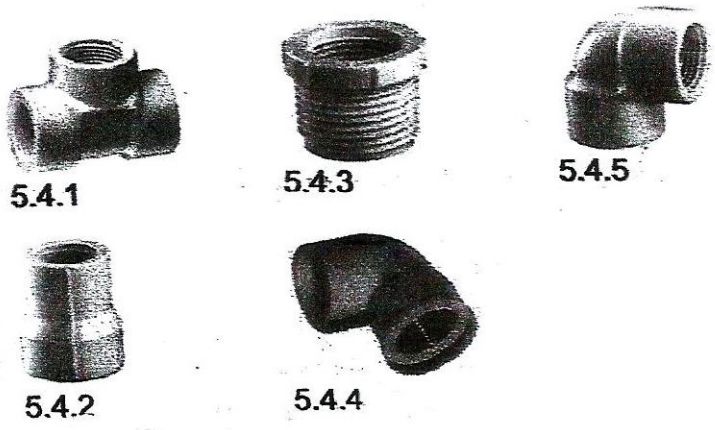
## QUESTION 5: COLD-WATER SUPPLY

5.1 Name the TWO conventional methods used to join copper pipes. (2)

5.2 State the differences in the use of the operational design and construction of a stop-cock compared to a full-way valve (gate valve). (8)

5.3 State TWO functions of good flux. (2)

5.4 The drawing below shows different fittings for galvanized mild steel pipes (GMS). Write the correct name of the fitting next to the question number (5.4.1–5.4.5) in the ANSWER BOOK.




(5 × 1) (5)

**[17]**



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## QUESTION 6: HOT-WATER SUPPLY

Make a neat, labelled sketch of a cross-sectional drawing of a vertical push-through hot-water geyser. Show the following:

6.1 Cold water inlet

6.2 Element

6.3 Thermostat

6.4 Metal shell

6.5 Vermiculite

6.6 Secondary flow pipe

(6 × 2) **[12]**

## QUESTION 7: DRAINAGE

7.1 Name the FOUR types of material used to manufacture drain pipes. (4)

7.2 Explain what a septic tank is. (2)

7.3 Name THREE types of storage cisterns that can be installed to supply water to a toilet. (3)

7.4 Write the following abbreviations of sanitary fittings and fixtures in full:

7.4.1 FV

7.4.2 S

7.4.3 CL

7.4.4 B

7.4.5 SVP

(5 × 1) (5)

7.5 Name THREE functions of a flushing cistern. (3)

7.6 Any drainage installation must be provided with adequate access to the installation for the purpose of inspection, testing or internal cleaning.

Name THREE instances where access to pipes should be provided. (3)

**[20]**

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## QUESTION 8: SHEET METAL WORK

8.1 What is the purpose of a joint in sheet metal work? (1)

8.2 State THREE advantages of uPVC used for rain-water guttering. (3)

8.3 List FOUR different types of sheet metal joints. (4)

8.4 Name THREE methods used in pattern development. (3)

**[11]**

## QUESTION 9: CALCULATIONS

9.1 Calculate the total pressure on the base of the following cold-water supply tank. The dimensions of the tank are 7,5 meters long, 6 meters wide and it is filled with water up to a depth of 2 meters. Give the answer in kPa. (5)

9.2 Calculate the volume of a square object of 2 m. (4)

**[9]**

**TOTAL: 100**

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