



higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

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NATIONAL CERTIFICATE

PLUMBING THEORY N1

(11022041)

12 November (X-Paper)
09:00 – 12:00

This question paper consists of 5 pages and 2 diagram sheets.

DEPARTMENT OF HIGHER EDUCATION AND TRAINING
REPUBLIC OF SOUTH AFRICA
NATIONAL CERTIFICATE
PLUMBING THEORY N1
TIME: 3 HOURS
MARKS: 100

T1951(E)(N12)T

-2-

INSTRUCTIONS AND INFORMATION

1. Answer ALL the questions.
2. Read ALL the questions carefully.
3. Number the answers correctly according to the numbering system used in this question paper.
4. Check ALL the calculations.
5. ALL diagrams, sketches and drawings must be reasonably large, in good proportion, fully labelled and done in pencil.
6. ALL abbreviations and symbols must be done in accordance with the standard SABS National Building Regulations.
7. Write neatly and legibly.

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 will be stored safely.
(2)

[5]

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QUESTION 2: TOOLS AND MACHINES

- 2.1 What is a groover used for? (1)
- 2.2 Name TWO types of pipe vices used by the plumber. (2)
- 2.3 Explain TWO uses for each of the following machines: (2)
- | | |
|-------|-------------------|
| 2.3.1 | Rolling machines |
| 2.3.2 | Hand lever shears |
| 2.3.3 | Jenny |
- 2.4 Explain why cutting oil is continuously pumped onto a pipe while cutting a thread on the pipe with a threading machine. (1)

[10]

QUESTION 3: METALS AND MATERIALS

- 3.1 Name ONE type of solder and state its composition when soldering sheet metal work. (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 THREE characteristics of it. (4)

[8]

QUESTION 4: SOLDERING AND WELDING

- 4.1 Describe the process of arc welding. (3)
- 4.2 Explain the difference between the following flames with regard to their gas mixture: (2)
- | | |
|-------|-------------------|
| 4.2.1 | Neutral flame |
| 4.2.2 | Carburising flame |
| 4.2.3 | Oxidising flame |
- 4.3 State TWO safety precautions that should be adhered to when oxy-acetylene welding apparatus is used. (2)

[8]

PTO

QUESTION 5: COLD-WATER SUPPLY

- 5.1 Name the TWO conventional methods used to join copper pipes. (2)
- 5.2 State the difference 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 a good flux. (2)
- 5.4 DIAGRAM SHEET 1 (attached), shows eight different fittings for galvanised mild steel pipes (GMS). Write the correct names of any FIVE of the fittings next to the number in the ANSWER BOOK. (5)

[17]

QUESTION 6: HOT-WATER SUPPLY

Make a neat, simple, labelled, single-lined cross-sectional drawing of a vertical combination hot-water geyser. Show the following:

- 6.1 Incoming cold-water supply (with stop-cock) (1)
- 6.2 Ball valve (float valve) with float (1)
- 6.3 Filler tube (1)
- 6.4 Expansion pipe (1)
- 6.5 Element and thermostat (1)
- 6.6 Insulation (thermal) of geyser (1)
- 6.7 Hot-water supply (1)
- 6.8 Indicate ALL pipe sizes (1)
- 6.9 Drain cock and drip tray (2)

NOTE: 2 marks for drawing

[12]

QUESTION 7: DRAINAGE

- 7.1 Name the FOUR types of material used to manufacture drain pipes. (4)
- 7.2 Describe the term *fitting* as used in the plumbing industry. (2)

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- 7.3. DIAGRAM SHEET 2 (attached), shows a cross-sectional drawing of a waste-water grating and overflow of a hand basin where different components are indicated by means of numbers. Write the names of the numbered components next to the numbers (1 - 8) in the ANSWER BOOK. (8)
- 7.4. Explain the preparation and procedure to join two 110 mm uPVC glue/pentaweld pipes together. (4)
- 7.5. Explain what will happen and why, if the gradient or fall of a sewer line is ...
 7.5.1 too shallow.
 7.5.2 too steep. (1)
- [20] (1)

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. Describe, with the aid of neat sketches, THREE steps to follow to make a grooved seam joint. (6)
- 8.4. Name TWO of the three main methods used for drawing pattern developments. (2)
- [12] (2)

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 metres long, 6 metres wide, and it is filled with water up to a depth of 2 metres. Give the answer in kPa. (4)
- 9.2. Calculate the volume of a square object of 2 m. (4)
- [8] (4)
- TOTAL: 100

FITTINGS FOR MILD STEEL PIPES

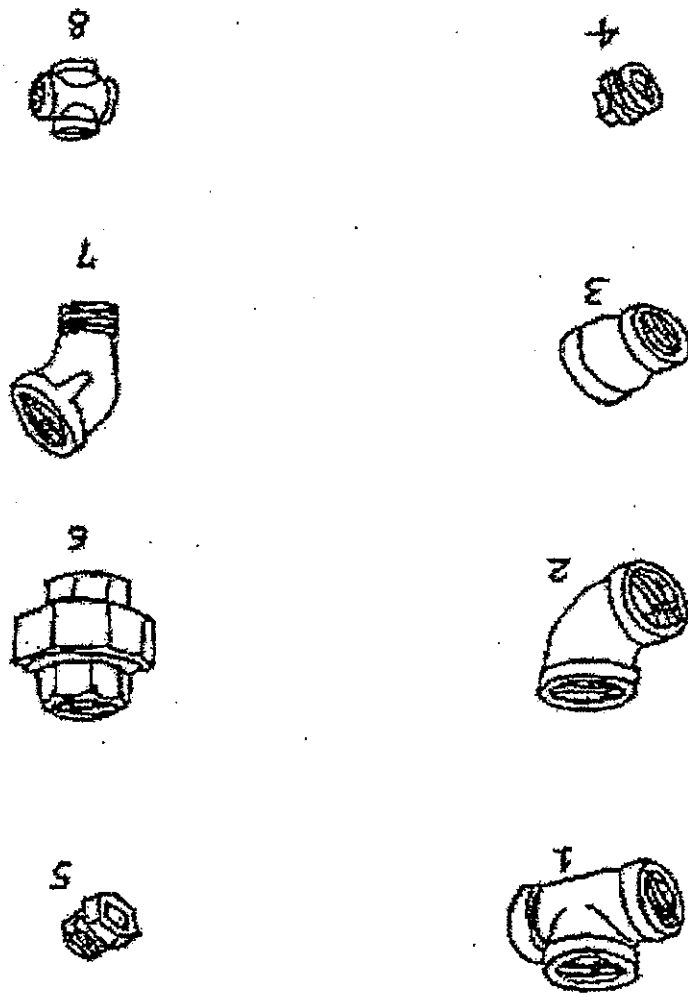


DIAGRAM SHEET 2

QUESTION 7.3

BASIN WASTE UNION/GRATING

