higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE

PLUMBING THEORY N1

(11022041)

23 November 2022 (X-paper)
09:00–12:00

Drawing instruments and nonprogrammable calculators may be used.

This question paper consists of 6 pages.

164Q1E2223

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DEPARTMENT OF HIGHER EDUCATION AND TRAINING
REPUBLIC OF SOUTH AFRICA

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

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

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QUESTION 1: SAFETY AND HOUSEKEEPING

1.1 Briefly explain the purpose of each of the following as it relates to scaffolding safety:

1.1.1 Toe boards

1.1.2 Guardrails

(2 × 2) (4)

1.2 What is the minimum thickness of a scaffolding plank? (1)

[5]

QUESTION 2: TOOLS AND MACHINES

2.1 State FIVE safety measures to keep in mind when mounting a grinding wheel on a grinding machine. (5)

2.2 Which THREE precautionary measures must be taken when measuring with a measuring tape? (3)

2.3 Why must a file be equipped with a handle? (2)

[10]

QUESTION 3: METALS AND MATERIALS

3.1 Give TWO advantages of each of the following metals used in plumbing:

3.1.1 Copper

3.1.2 Lead

3.1.3 Galvanised steel

3.1.4 Aluminium

(4 × 2) (8)

3.2 Give TWO methods to protect ferrous metals against rust. (2)

[10]

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QUESTION 4: SOLDERING AND WELDING

4.1 State FOUR safety precautions that should be adhered to when executing oxy-acetylene welding. (4)

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

4.2.1 Neutral flame

4.2.2 Carbonising flame

4.2.3 Oxidising flame

(3 × 1) (3)

4.3 Name the cable that must be clamped securely to the metal to be welded during arc welding. (1)

[8]

QUESTION 5: COLD-WATER SUPPLY

5.1 What is the difference between a *direct cold-water system* and an *indirect cold-water system*? (2 + 2) (4)

5.2 List FOUR sources of water. (4)

5.3 Name and explain the THREE phases of in the water cycle. (3 × 3) (9)

[17]

QUESTION 6: HOT-WATER SUPPLY

6.1 Explain the working principle of a push-through hot-water geyser. (5)

6.2 Is there a supply tank on a high-pressure hot-water geyser? Give a reason for the answer. (3)

6.3 Can a tap be installed at the draw-off point of a push-through geyser? Substantiate the answer. (3)

6.4 How is water heated through a solar-heating panel? (1)

[12]

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QUESTION 7: DRAINAGE

7.1 Explain each of the following terms:

7.1.1 Waste water

7.1.2 Soil water

7.1.3 Discharge pipe

7.1.4 Sewage

(4 × 2) (8)

7.2 What are earthenware drainpipes made of? (1)

7.3 Which type of joint would be used on earthenware drainpipes when there is a large amount of ground movement? (1)

7.4 Are plain-ended earthenware pipes available without sockets? Substantiate the answer. (2)

7.5 Can uPVC drainpipes be tested immediately after they have been laid? Substantiate the answer. (2)

7.6 Which type of connecting joint can be used on soil uPVC pipes? (1)

7.7 What is the first step to take when joining uPVC pipes? (2)

7.8 Can cast-iron pipes be recommended for drains under buildings? Substantiate the answer. (2)

7.9 How are pitch-fibre pipes made? (1)

[20]

QUESTION 8: SHEET-METAL WORK

8.1 Explain, with the aid of neat sketches, the steps to follow when making a grooved seam joint. (6)

8.2 What is the purpose of a joint in sheet-metal work? (2)

8.3 Name FOUR parts of flashing around the area where a chimney stack passes through a roof. (4)

[12]

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QUESTION 9: CALCULATIONS

A rectangular tank has a length of 3,5 m, a width of 1,5 m and a height of 1,2 m.

Calculate:

9.1 The volume of the tank

9.2 The contents of the tank in litres

9.3 The mass of the water when the tank is filled

(3 × 2) **[6]**

TOTAL: 100

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