higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

PLUMBING
NQF LEVEL 3

(12030373)

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

Drawing instruments and nonprogrammable calculators may be used.

This question paper consists of 5 pages and 1 diagram sheet.

401Q1N2216

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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. All sketches and/diagrams must be neat, reasonably large, in good proportion and fully labelled in pencil.
6. Abbreviations and symbols must comply with the latest National Building Regulations and all relevant SANS (SABS) codes.
7. Answer all questions in the ANSWER BOOK except for QUESTION 6.1 which must be answered on a DRAWING SHEET.
8. Use only a black or blue pen.
9. Write neatly and legibly.

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QUESTION 1: COLD-WATER SUPPLY

1.1 Complete the following sentences by choosing a word or words from the list below. Write only the answer next to the question number (1.1.1–1.1.4) in the ANSWER BOOK.

Anti-syphon pipe; water meter; water-reticulation network; capillary joint; main pipe; transmission; communication pipe; syphon action; specification; compression joint

1.1.1 A/ An … is used to provide information about the volume of water consumed.

1.1.2 The supply pipe from the mains to the building is called a/ an …

1.1.3 The pipe layout for the water supply to a suburb is referred to as a/ an …

1.1.4 The type of joint that uses a brass olive and brass cab nut is known as a/ an …

(4 × 1) (4)

1.2 1.2.1 Describe a *water meter*. (2)

1.2.2 Write down TWO benefits of using a water-reticulation network.

(2 × 2) (4)

1.3 Which TWO materials can be used to make watertight joints in copper and GMS connections? (2)

1.4 Differentiate between *capillary joints* and *compression joints* as used in cold-water connections. (2 + 2) (4)

1.5 What is the function of an inline strainer? (2)

[18]

QUESTION 2: HOT-WATER SUPPLY

2.1 Make a neat, fully labelled diagrammatic sketch of an electrical hot-water heating installation with a vertical geyser with a pressure rating of 100 kPa. Clearly indicate all required pipes and valves including the anti-syphon loop. Ignore the safety drip tray. (8)

2.2 State FOUR advantages of a push-through geyser. (4)

2.3 What is the colour coding used to identify each of the valves with the following pressure ratings?

2.3.1 100 kPa

2.3.2 200 kPa

2.3.3 600 kPa

(3 × 1) (3)

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2.4 Briefly explain the function of a pressure-relief valve when it is installed with a pressure-control valve in a closed (unvented) hot-water installation. (4)

[19]

QUESTION 3: ABOVE-GROUND DRAINAGE SYSTEM

3.1 Define the term *drainage installation*. (2)

3.2 Name TWO methods used to join cast-iron pipes and fittings together. (2)

3.3 Explain each of the following terms:

3.3.1 One-pipe system

3.3.2 Two-pipe system

(2 × 2) (4)

3.4 Briefly explain, with the aid of a neat sketch, a one-pipe system as one of the systems used for drainage disposal. (6)

3.5 Explain TWO functions of a good ventilation pipe. (2)

[16]

QUESTION 4: SANITARY INSTALLATION

4.1 Define the term *impermeable material*. (2)

4.2 Differentiate between the TWO ways used to supply water to a water closet.

(2 × 2) (4)

4.3 Write down THREE requirements for the installation of soil-water appliances.

(3 × 2) (6)

4.4 Name TWO types of flush valves used to supply water to a water closet. (2)

[14]

QUESTION 5: RAINWATER SYSTEM

5.1 List FOUR types of materials suitable for the manufacture of gutters and rainwater systems. (4)

5.2 State THREE characteristics of uPVC. (3)

5.3 Provide a FIVE-STEP, sequential guide to follow when aligning and securing aluminium gutter brackets against a fascia board during installation of fibre-cement gutters. (5)

5.4 Briefly explain the procedure to follow before joining GMS gutters and fittings. (4)

5.5 Why are GMS pipes not recommended in coastal regions? (2)

[18]

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QUESTION 6: VENT PIPE FLUSHING

The DIAGRAM SHEET (attached) shows two views of a square pipe.

Use the parallel-line method and develop, to scale 1:5, the full pattern of the truncated pipe. Do not make any allowances for the seam. **[10]**

QUESTION 7: TRENCHING, EXCAVATION AND TRENCH SUPPORT

7.1 Briefly explain the purpose of supporting trenches in underground drainage systems. (2)

7.2 What are THREE important considerations when planning and performing underground pipework where trenching, excavations, trench support and backfilling of trenches are required. (3)
[5]

TOTAL: 100

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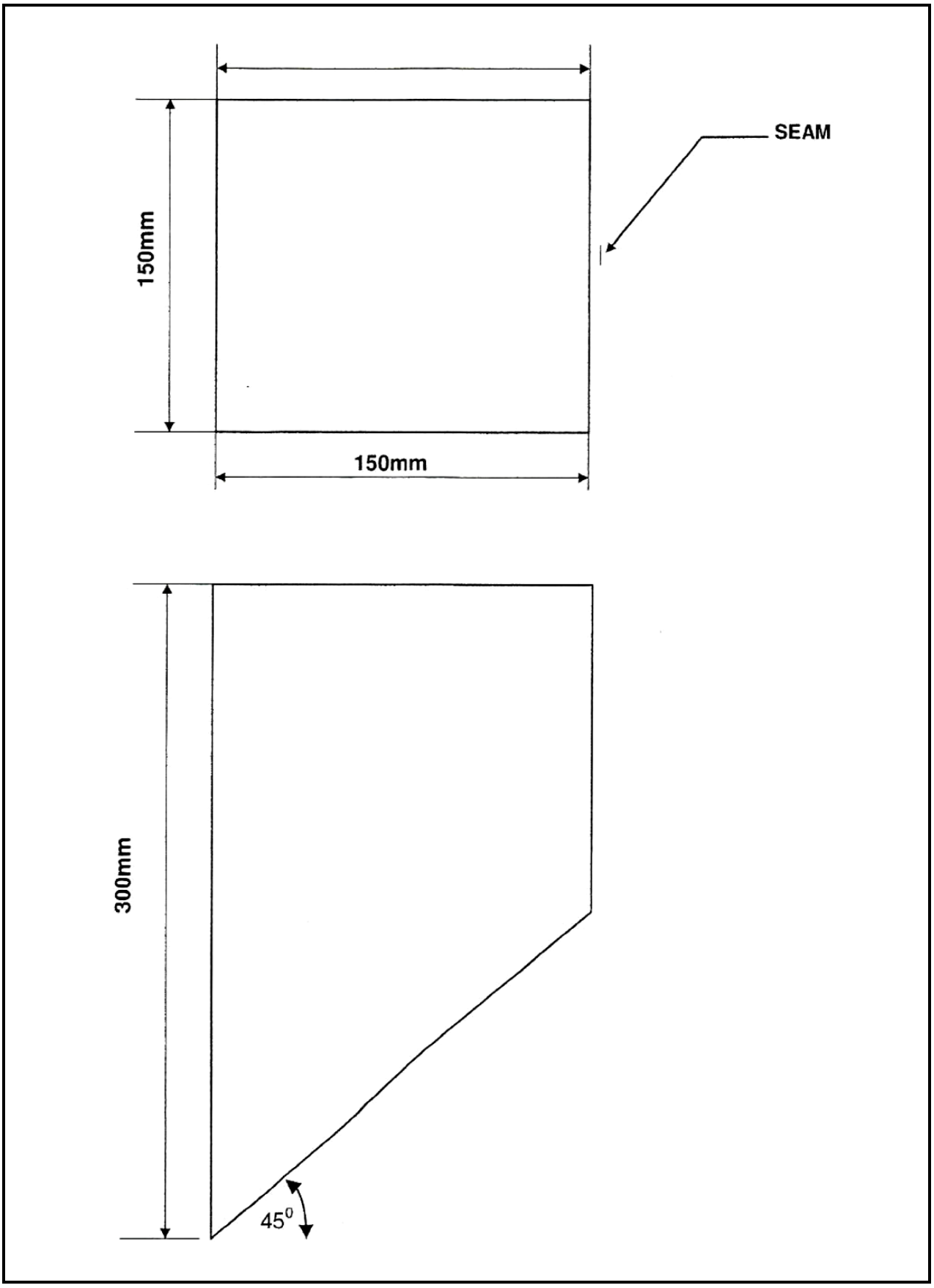
DIAGRAM SHEET



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