higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

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PLUMBING
NQF LEVEL 3

(12030373)

9 March 2018 (X-Paper)
09:00–12:00

Drawing instruments and calculators may be used.

This question paper consists of 5 pages.

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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. ALL questions must be done in the ANSWER BOOK.
5. ALL sketches and/or diagrams must be neat, reasonably large, in good proportion, fully labelled and done in pencil.
6. ALL abbreviations and symbols must comply with the latest National Building Regulations and ALL relevant SANS (SABS) codes.
7. Start each question on a NEW page.
8. Rule off across the page on completion of each question.
9. Write neatly and legibly.

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QUESTION 1: COLD-WATER SUPPLY

1.1 Define each of the following terms used in the plumbing industry:

1.1.1 Friction loss

1.1.2 Design velocity

1.1.3 Volume

(3 × 2) (6)

1.2 Explain the requirements that should be considered when fixing pipe support to any structures that will carry or support pipework. (3)

1.3 Name FOUR site and structural constraints that one may find when designing a piping layout for a residential cold-water system. (4)

1.4 In the process of distributing water after it has been purified, tested and it has met the minimum quality standards, the water flows to consumers' reservoirs before entering the reticulation network.

1.4.1 Briefly describe THREE general quality requirements for portable water. (3)

1.4.2 Name TWO types of pipes that one can use for pipework connections in a cold-water residential system. (2)

[18]

QUESTION 2: HOT-WATER SUPPLY

2.1 Make a neat, fully labelled diagrammatic sketch of an electrical hot-water heating installation system with a horizontal geyser with a pressure rating of 400 kPa.

Clearly indicate ALL required pipes and valves, including the antisiphon loop.

NOTE: Ignore the safety drip tray. (8)

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

2.3 Name the colour coding used to identify 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 describe the functions of a pressure relief valve when it is installed with a pressure control valve in a closed (unvented) hot-water installation system. (4)
[19]

QUESTION 3: ABOVE-GROUND DRAINAGE SYSTEM

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

3.2 Give TWO methods to join cast-iron pipes to fittings. (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 Name FOUR materials used to manufacture drain pipes. (4)

3.5 Describe the functions of a good ventilation pipe. (4)
[16]

QUESTION 4: SANITARY INSTALLATION

4.1 Write each of the following acronyms in full:

4.1.1 ABC

4.1.2 ASP

(2 × 1) (2)

4.2 Give TWO different ways used to install the water supply to a water closet.
(2 × 2) (4)

4.3 Explain the requirements needed for the installation of soil water appliances.
(3 × 2) (6)

4.4 Name TWO types of flush valves used to supply water to the water close. (2)
[14]

QUESTION 5: INSTALLING AND MAINTAINING RAINWATER SYSTEMS

5.1 What is the function of a gutter in the building industry? (2)

5.2 Name THREE methods used to join GMS gutters. (3)

5.3 Describe THREE characteristics of uPVC. (3)

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5.4 Complete the following paragraph by writing down the missing word or words next to the question number (5.4.1–5.4.5) in the ANSWER BOOK.

Gutter brackets for GMS gutters are made of (5.4.1) … and are available to fit the (5.4.2) … and (5.4.3) … of the different GMS gutters. The brackets of the gutters are shaped to (5.4.4) … or (5.4.5) … gutter profiles.

(5 × 1) (5)

5.5 Explain in a sequential order the procedure to follow when fitting the gutters into the gutter brackets. (4)

[17]

QUESTION 6: VENT PIPE FLASHING

6.1 List FOUR materials used in the manufacturing of vent pipe flashings. (4)

6.2 Draw neat, labelled sketches of each of the following joints:

6.2.1 Grooved seam joint

6.2.2 Riveted seam joint

(2 × 3) (6)

[10]

QUESTION 7: TRENCHING, EXCAVATION AND TRENCH SUPPORT

7.1 Define the term *timbering*. (2)

7.2 Give FOUR examples of different levelling instruments used to excavate trenches to their required invert levels. (4)

[6]

TOTAL: 100

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