higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

PLUMBING
NQF LEVEL 3

(12030373)

21 November 2018 (Y-Paper)
13:00–16:00

Candidates need a calculator and drawing instruments.

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. Start each question on a NEW page.
5. Sketches must be neat, labelled and large enough so that ALL details can clearly be seen.
6. Write neatly and legibly.

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QUESTION 1: COLD WATER RETICULATION

1.1 1.1.1 What are the dangers of backflow or syphonage in a water supply system?

1.1.2 How can you stop backflow or syphonage in a water supply system?

(2 × 2) (4)

1.2 List FIVE points you should consider when calculating the pipe diameter for a residential cold-water system. (5)

1.3 Name TWO valves or pipefittings used to prevent backflow of water. (2)

1.4 How would you measure the nominal thickness of the following pipes:

1.4.1 GMS pipe

1.4.2 Copper pipe

(2 × 1) (2)

1.5 What is the main factor that affects the water's velocity or rate of flow through a pipe in a residential cold-water system? (2)

1.6 Why is it important to ensure that you will comply with the stipulations of the Water Services Act for the preservation of drinking water when you do an installation of a residential cold-water system? (2)

1.7 Briefly discuss why stop cocks are not recommended for low-pressure cold- and hot-water installations? (3)

[20]

QUESTION 2: HOT WATER RETICULATION

2.1 Explain the function of each of the following valves/arrangements in a hot-water installation:

2.1.1 Temperature and pressure safety valve

2.1.2 Vacuum breaker on the hot-water outlet pipe

2.1.3 Anti-syphonage loop

(3 × 3) (9)

2.2 Name FOUR advantages of a combination geyser. (4)

2.3 What is the best type of joint to use to connect valves and terminal fittings to copper pipes in a hot water supply system? (1)

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2.4 Make a neat, labelled, single line diagrammatic sketch of a water heating system with a 150 ℓ horizontal geyser with a pressure rating of 400 kPa. Indicate ALL the required valves, pipes and fittings. Make use of symbols specified by the relevant SANS codes. (6)
[20]

QUESTION 3: ABOVE-GROUND DRAINAGE SYSTEMS

3.1 3.1.1 Describe trap venting.

3.1.2 Why is trap venting used in above-ground drainage systems?
(2 × 2) (4)

3.2 Discuss the use of trap vent valves. (3)

3.3 Name THREE sanitary fixtures and their abbreviations. (6)

3.4 Give TWO requirements for materials used in the installation of soil, waste and vent systems (2)
[15]

QUESTION 4: SANITARY INSTALLATION

4.1 At what height do we usually install kitchen sinks? (1)

4.2 4.2.1 What diameter pipe do we use for the wastewater pipe work underneath the shower tray?

4.2.2 What type of pipe do we use for the wastewater pipe work underneath the shower tray?
(2 × 1) (2)

4.3 Briefly discuss the steps you would follow when preparing the bedding and brickwork for installing a conventional floor bath. (5)

4.4 Why do we fit a valve to the hot- and cold-water supply of the bidet? (2)

4.5 List THREE ways you can install a wash hand basin. (3)

4.6 Why does a water closet NOT need to be fitted with a water seal trap? (2)
[15]

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QUESTION 5: RAINWATER SYSTEM

5.1 List THREE different GMS downpipe fittings. (3)

5.2 What is the function of a rainwater system? (2)

5.3 Name TWO ways you can secure gutter brackets to the building. (2)

5.4 Describe how fibre cement downpipes and fittings are joined. (5)

5.5 Describe THREE ways GMS gutters and fittings can be joined. (3)

[15]

QUESTION 6: VENT PIPE FLUSHING

FIGURE 1 below shows the front view of a round pipe.

Make use of the parallel line method and develop only the full pattern of the truncated pipe. Do NOT make any allowances for the seam.

Use scale 1:5.

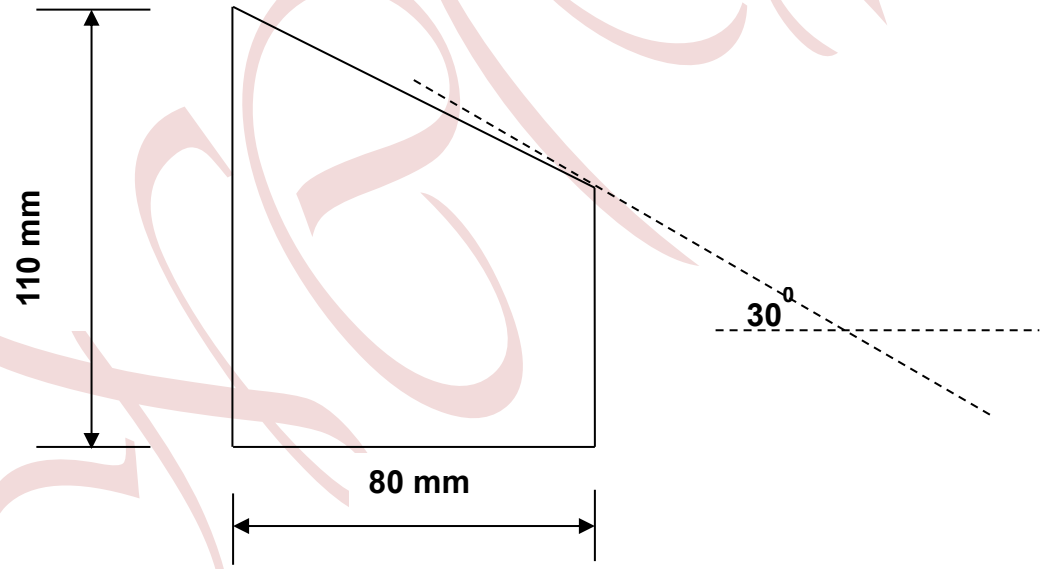

FIGURE 1 **[10]**

QUESTION 7: TRENCHING, EXCAVATION AND TRENCH SUPPORT

7.1 7.1.1 Explain the meaning of invert levels.

7.1.2 Explain the meaning of invert depths.

(2 x 2) (4)

7.2 What is the formula for working out a gradient? (1)

[5]

TOTAL: 100

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