higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

PLUMBING
NQF LEVEL 2

(12020162)

17 November 2022 (Y-paper)
13:00–16:00

Calculators may be used.

This question paper consists of 7 pages.

499Q1N2217

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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. The drawings, sketches and diagrams must be done in pencil.
5. The sketches and/or diagrams must be neat, reasonably large, in proportion and fully labelled.
6. Rule off across the page after each completed question.
7. Start each question on a new page.
8. Use only a black or a blue pen.
9. Write neatly and legibly.

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QUESTION 1: INTRODUCTION TO PLUMBING

1.1 State FOUR roles of a plumbing project manager. (4)

1.2 Before water can be considered as safe for domestic use, it needs to go through a purification process.

List SIX stages of the water-purification process in sequential order. (6)

1.3 Indicate whether the following statements are TRUE or FALSE. Choose the answer and write only 'True' or 'False' next to the question number (1.3.1–1.3.5) in the ANSWER BOOK.

1.3.1 When raw water is treated, the dissolved iron present in the untreated water should not be removed.

1.3.2 A carpenter is responsible to install an underground drain.

1.3.3 Plumbers should start the plumbing installation only after all the other trades have completed their work.

1.3.4 The plumber is usually in charge of all the activities required to install the underground drain.

1.3.5 Water fit for human consumption should have a sparkling clear appearance.

(5 × 1) (5)
[15]

QUESTION 2: PLUMBING PRINCIPLES AND CODE OF PRACTICE

2.1 Calculate the flow of pressure at the tap, if the water tank height at a certain point is 2,5 m. (4)

2.2 A water tank is placed on a platform 15 m high. The water level in the tank is 1,3 m above the top of the platform.

Calculate the pressure at a tap placed 7 m below the top of the platform. (6)

2.3 Give THREE reasons why all plumbers should follow the plumbing industry code of practice. (3)

2.4 Briefly explain what is meant by the term *friction loss.* (2)
[15]

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QUESTION 3: MATERIALS, TOOLS, AND EQUIPMENT

3.1 Choose a description from COLUMN B that matches an item in COLUMN A. Write only the letter (A–E) next to the question number (3.1.1–3.1.5) in the ANSWER BOOK.

COLUMN A		COLUMN B	
3.1.1	A scriber	A	clear waste blocking pipes
3.1.2	Basin wrench	B	used to mark circle and arc
3.1.3	Plunger	C	cut plastic and copper pipe and GMS
3.1.4	Hacksaw	D	to reach tight spots under sinks and basins
3.1.5	Divider	E	a sharp instrument used to mark lines when measuring

(5 × 1) (5)

3.2 Name any FIVE basic tools. (5)
[10]

QUESTION 4: WATER PIPE ASSEMBLY

4.1 After cutting a GMS pipe, using a steel pipe cutter, explain what should be done to the inside of the pipe, and why. (2)

4.2 State THREE ways of joining monolayer pipes. (3)

4.3 Indicate whether the following statements are TRUE or FALSE. Choose the answer and write only 'True' or 'False' next to the question number (4.3.1–4.3.10) in the ANSWER BOOK.

4.3.1 Multilayer pipes are made of copper.

4.3.2 Multilayer pipes can be cut with a sharp knife.

4.3.3 Multilayer pipes can be bent using one's hands.

4.3.4 Multilayer pipes are suitable for use in underground drainage.

4.3.5 Multilayer pipes could be bent by using an outside bending spring.

4.3.6 A crimping tool is used to press multilayer couplings over PEX pipe.

4.3.7 A pipe reamer is a tool used to smooth, taper, and prepare the edges of pipes for joining purposes.

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4.3.8 Rigid monolayer pipes are lightweight and could easily be rolled into small coils.

4.3.9 Monolayer pipes are suitable for use as garden hose piping.

4.3.10 Flexible monolayer pipes are suitable for use in hot-water installations.

(10 × 1) (10)

4.4 Describe the procedure that should be followed when joining two copper pipes using a capillary fitting under the following headings:

4.4.1 Preparation of pipe (4)

4.4.2 Joining method (4)

4.4.3 Cleaning and testing process (2)
[25]

QUESTION 5: CUTTING AND JOINING OF METALS

5.1 Name FIVE types of flashing. (5)

5.2 Which TWO gases are commonly used to do gas welding or brazing? (2)

5.3 Name THREE tools/pieces of equipment that could be used to cut thin sheet metal. (3)
[10]

QUESTION 6: SET OUT BELOW-GROUND DRAINAGE SYSTEMS

6.1 Name SIX main points to consider when laying out a drainage system for a building. (6)

6.2 When drains are laid, access points are made so that plumbers can get into the pipe when necessary.

Name FOUR places where these access points are made. (4)

6.3 A drain with a gradient of 1:40 is 15 000 mm long.

Calculate the vertical fall of the pipe to give the correct slope. (5)

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6.4 The sketches below show U-PVC plumbing fittings for the drains and waste pipes. Write only the names of each fitting next to the question number (6.4.1–6.4.10) in the ANSWER BOOK.

6.4.1



6.4.2



6.4.3



6.4.4



6.4.5



6.4.6



6.4.7



6.4.8



6.4.9



6.4.10



(10 × 1) (10)

[25]

TOTAL: 100

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