higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

PLUMBING
NQF LEVEL 4

(12030544)

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

This question paper consists of 6 pages.

501Q1N2217

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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 section on a new page.
5. Work you do not want to be marked must be clearly crossed out.
6. Use only a blue or black pen.
7. Write neatly and legibly.

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QUESTION 1: BASIC BUILDING WORK AND BUILDING MANHOLES

1.1 Indicate whether the following statements are TRUE or FALSE by writing only 'True' or 'False' next to the question number (1.1.1–1.1.5) in the ANSWER BOOK.

1.1.1 Straight edges are used to check for flatness on different surfaces.

1.1.2 A single leaf-wall is a continuous vertical section of wall that is two masonry units wide.

1.1.3 Steel reinforcements are used to strengthen walls.

1.1.4 A manhole is an inspection chamber deeper than 750 mm and big enough for a person to enter the chamber to reach a drain.

1.1.5 An invert level is the top point of the inside open section of a pipe.

(5 × 1) (5)

1.2 What material could be used to seal the joints between the components of a precast concrete manhole? (1)

1.3 Explain what is meant by the term *soffit.* (2)

1.4 Complete the following sentence by writing the missing words next to the question number (1.4.1–1.4.2) in the ANSWER BOOK.

The benching must be finished off with a coat of (1.4.1 …) cement mortar, and the top of channel must be rounded off to a radius of (1.4.2 …) mm.

(2 × 1) (2)

[10]

QUESTION 2: BELOW GROUND DRAINAGE SYSTEMS

2.1 Name the TWO different levels used when laying underground drainage? (2)

2.2 Differentiate between an *inspection chamber* and a *manhole*. (4)

2.3 What is the most common gradient at which a 100ø drainpipe is laid? (1)

2.4 When should one use anchor blocks to stabilise drainage pipes? (1)

2.5 Specify FIVE places where access points are required in the drainage system. (5)

2.6 Why should one not backfill the trench at once? (2)

2.7 Name THREE different levelling instruments that can be used to excavate trenches to their required invert level. (3)

2.8 List TWO kinds of air tests. (2)

[20]

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QUESTION 3: PLUMBING MAINTENANCE AND REPAIRS

3.1 At what typical pressure do municipalities feed water to houses? (1)

3.2 What advice would you give an apprentice to repair a leaking copper pipe? (2)

3.3 Name THREE tools from which you would select to cut out a damaged piece of copper pipe. (3)

3.4 Provide an EIGHT- POINT step by step guide to follow when repairing a tap. (8)

3.5 What precaution is necessary when replacing a geyser element? (1)

3.6 Name any THREE methods used to remove a blockage or obstruction in a drainage system. (3)

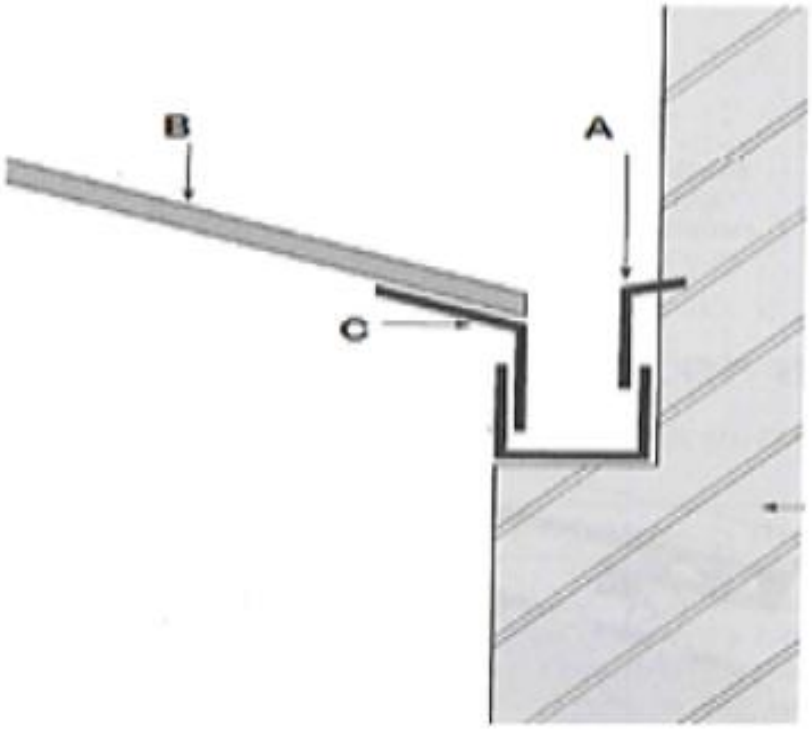
3.7 Why is it necessary to chamfer the outside edge of a pipe in a joint? (2)

[20]

QUESTION 4: BOX GUTTERS AND CHIMNEY FLASHING

4.1 What is a *stop end* and what purpose does it serve? (2)

4.2 FIGURE 1 below shows a cross-section of an installed box gutter. Name items A, B and C. Write only the name of the item next to the letter (A–C) in the ANSWER BOOK. (3)



4.3 Name TWO types of tools used to cut GMS sheeting. (2)

4.4 What is the function of an abutment flashing? (2)

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4.5 List THREE parts of chimney flashing. (3)

4.6 What should be done to avoid electrolytic corrosion between a cover flashing and an abutment flashing? (3)

[15]

QUESTION 5: INSTALL A SOLAR WATER HEATER

5.1 What is *solar energy*? (2)

5.2 How does a solar panel work? (1)

5.3 Specify TWO fundamental requirements for an efficient solar heating system. (2)

5.4 Name THREE types of solar collectors. (3)

5.5 Complete the following sentences by choosing a word or words from the list below. Write only the answer next to the question number (5.5.1–5.5.8) in the ANSWER BOOK.

natural convection; rising; water; collector; tank; heats; lighter; cooler; energy; heat exchanger

Thermo-syphon systems rely on the (5.5.1 …) of warm water (5.5.2 …) to circulate (5.5.3 …) through the collectors and to the (5.5.4 …) which is located above the (5.5.5 …). As water in the solar collector (5.5.6 …), it becomes (5.5.7 …) and rises naturally into the tank above. Meanwhile, the (5.5.8 …) water flows down the pipes to the bottom of the collector improving circulation. (8 × 1) (8)

5.6 What is a *demand water heater*? (2)

5.7 List THREE very important factors that you must consider before installing a solar hot-water system. (3)

5.8 Briefly explain the difference between *glazed flat-plate collectors* and *unglazed flat-plate collectors.* (2 × 2) (4)

[25]

QUESTION 6: BASIC BUSINESS CONCEPTS

6.1 What important document will you prepare to convince the bank to lend you money for your new business? (1)

6.2 What is *market research*? (2)

6.3 WrIte down TWO questions that an entrepreneur can ask when doing market research about potential competitors. (2)

6.4 What is *profit*? (2)

6.5 State THREE disadvantages of using cash. (3)

[10]

TOTAL: 100

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