higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE

PLUMBING THEORY N1

(11022041)

13 April 2021 (X-paper)
09:00–12:00

Nonprogrammable calculators may be used.

This question paper consists of 7 pages.

156Q1A2113

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DEPARTMENT OF HIGHER EDUCATION AND TRAINING
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE
PLUMBING THEORY N1
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. Use only a black or blue pen.
6. Write neatly and legibly.

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QUESTION 1: SAFETY AND HOUSEKEEPING

1.1 Explain the safe use of ladders with regard to:

1.1.1 Ascending and descending ladders

1.1.2 Care and storage of ladders

(2 × 2) (4)

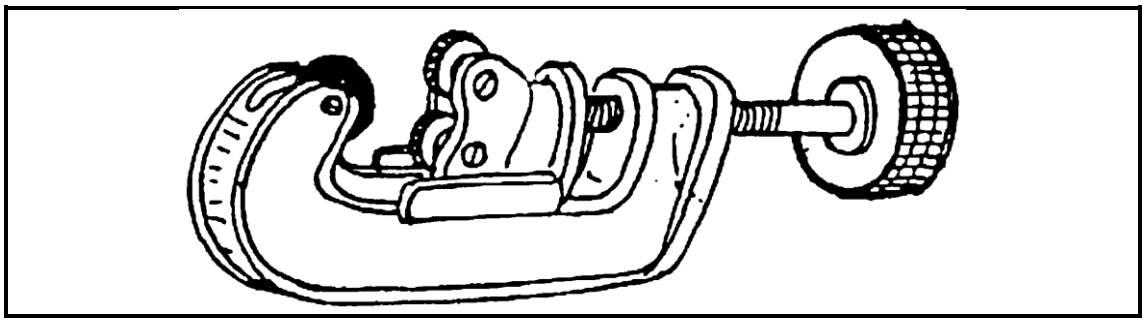
1.2 What is an accident? (1)

[5]

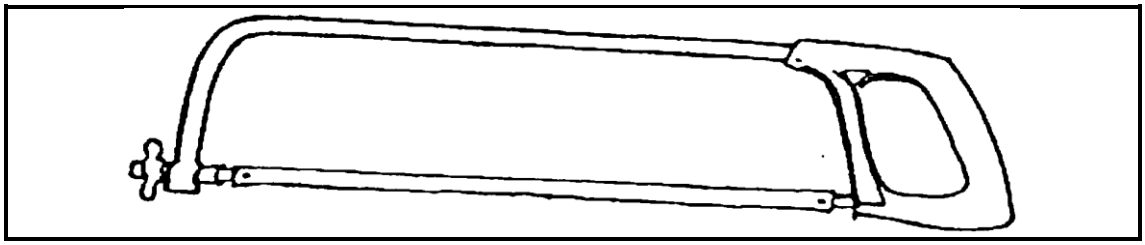
QUESTION 2: TOOLS AND MACHINERY

Identify each of the following hand tools and give ONE use of each:

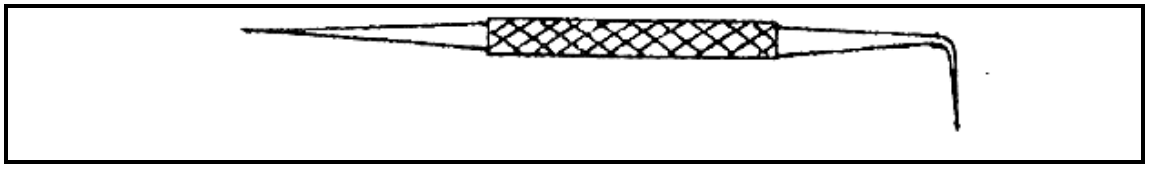
2.1



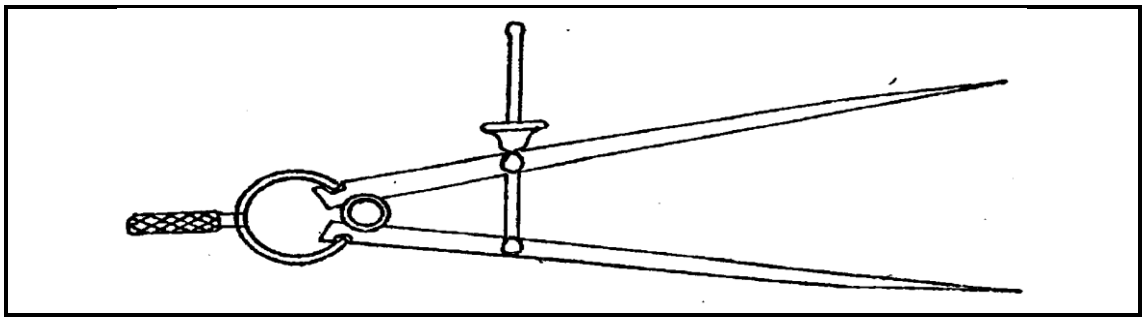
2.2



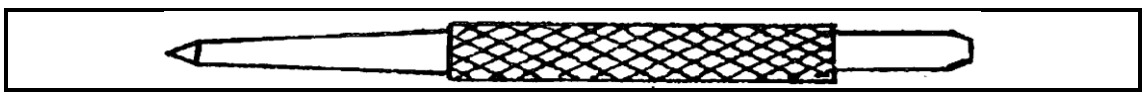
2.3



2.4



2.5



(5 × 2) **[10]**

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QUESTION 3: METALS AND MATERIALS

3.1 Define the term *coefficient of expansion*. (2)

3.2 Name THREE methods to protect ferrous metals against rust. (3)

3.3 Explain the electrolytic reaction with regard to water pipes. (3)
[8]

QUESTION 4: SOLDERING AND WELDING

4.1 Explain how to test for a good solder. (4)

4.2 Give the colour of each of the following:

4.2.1 Oxygen hose

4.2.2 Acetylene hose

(2 × 1) (2)

4.3 Name TWO pieces of personal protective equipment (PPE) that must be worn during oxy-acetylene cutting. (2)
[8]

QUESTION 5: COLD-WATER SUPPLY

5.1 List FOUR sources of water. (4)

5.2 Briefly explain the procedure to follow when using galvanised mild-steel pipes. (4)

5.3 Differentiate between a *bib tap* and a *pillar tap* regarding its installation. (2 × 2) (4)

5.4 Name TWO ways of joining copper pipes and explain each method. (4)

5.5 Why is hemp or thread tape used on threads of galvanised steel pipes? (2)
[18]

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QUESTION 6: HOT-WATER SUPPLY

6.1 Name and explain the THREE principles of heat transfer that apply to hot-water installations. (3 × 2) (6)

6.2 Briefly explain why thermal insulation is used on hot-water pipework. (4)

6.3 State each of the following values in °C at standard atmospheric pressure (760 mm of mercury):

6.3.1 Boiling point of water

6.3.2 Freezing point of water

(2 × 1) (2)

[12]

QUESTION 7: DRAINAGE

7.1 Explain each of the following terms as it applies to plumbing:

7.1.1 Waste water

7.1.2 Soil water

7.1.3 Discharge pipe

7.1.4 Sewage

(4 × 2) (8)

7.2 Name FOUR materials used to manufacture drainpipes. (4)

7.3 Explain TWO types of urinals normally installed at communal ablutions. (2)

7.4 Define the term *inspection chamber*. (2)

7.5 State whether uPVC drainpipes be tested immediately after it has been laid and substantiate the answer. (2)

7.6 State whether cast-iron pipes be used for drains under buildings and substantiate the answer. (2)

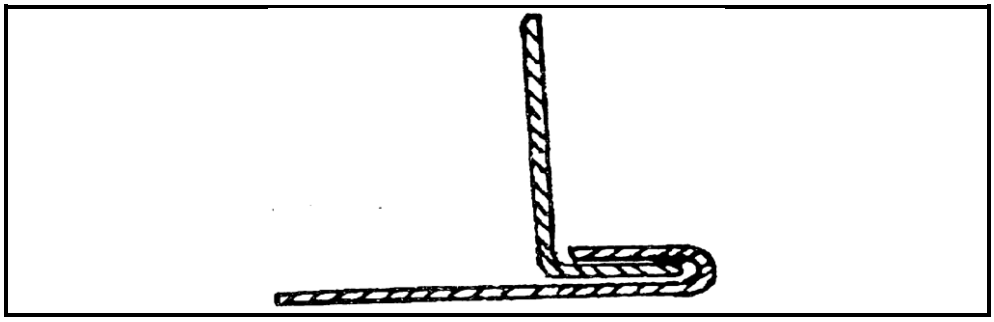
[20]

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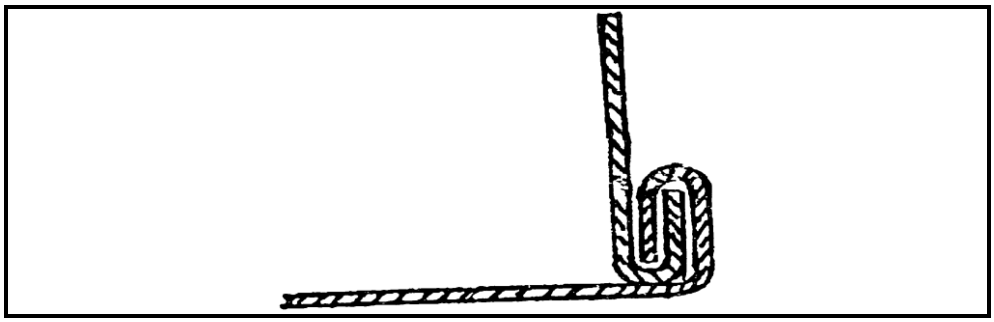
QUESTION 8: SHEET METALWORK

8.1 Identify each of the following sheet-metal joints:

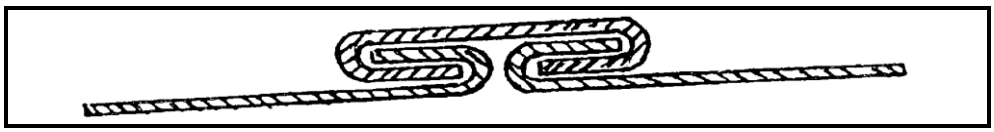
8.1.1



8.1.2



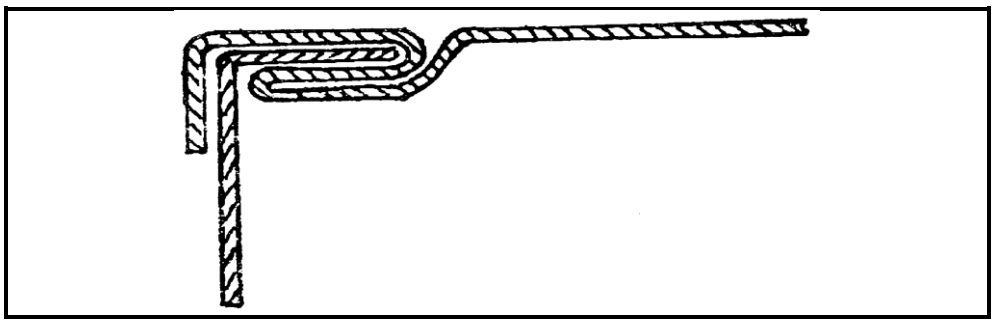
8.1.3



8.1.4



8.1.5



(5 × 1) (5)

8.2 What is the purpose of a joint in sheet metalwork? (2)

8.3 Name TWO main methods used in pattern development. (2)

8.4 Name THREE types of metal used to make flashing. (3)

[12]

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QUESTION 9: CALCULATIONS

A mild-steel sheet has a length of 4 m and a width of 3 m.

Calculate:

9.1 The circumference of the sheet (4)

9.2 The area of the sheet (3)

[7]

TOTAL: 100

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