higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE

PLUMBING THEORY N2

(11022052)

9 April 2020 (X-paper)
09:00–12:00

This question paper consists of 5 pages and 3 diagram sheets.

221Q1A2009

Copyright reserved

DEPARTMENT OF HIGHER EDUCATION AND TRAINING
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE
PLUMBING THEORY N2
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. Write neatly and legibly.

Copyright reserved

QUESTION 1: COLD-WATER SUPPLY

1.1 Indicate whether the following statements are TRUE or FALSE by writing only 'True' or 'False' next to the question number (1.1.1–1.1.10) in the ANSWER BOOK.

1.1.1 Permanently hard water is caused by sulphates of calcium and magnesium in the water.

1.1.2 Reservoirs are usually built in lower-lying areas to deliver a proper constant pressure.

1.1.3 A pressure zone is a division of the reticulation network of a suburb where water is supplied from a tower or reservoir serving that particular area.

1.1.4 The push-type or bayonet and screw-in type connection are two ways of linking fire hoses to a fire hydrant.

1.1.5 Water hammer is a pressure surge or wave caused when a fluid in motion is forced to stop or change direction suddenly.

1.1.6 Flush valves are used instead of pipes.

1.1.7 A backflow preventer is an automatic aluminium closing valve with female ends.

1.1.8 Lacto products are coded black and white in compliance with the SABS 195:1975.

1.1.9 The wet-pipe system is a system where water is always present in pipes and filled up to the sprinkler heads.

1.1.10 The pillar-type hydrant gets water directly from a water reticulation network in streets

(10 × 1) (10)

1.2 Briefly describe *temporary hardness of water*. (3)

1.3 State THREE functions of a fire hydrant. (3)

1.4 List FOUR advantages of a gravity system in water supply. (4)

[20]

Copyright reserved

QUESTION 2: HOT-WATER SUPPLY

2.1 An electric geyser is interconnected with a solar panel providing heated water to a geyser.

Draw a neat, labelled diagram of a hot-water installation from the cold-water supply tank to the solar collector (panel), hot-water geyser and hot-water outlet pipe. Use the standard abbreviations and symbols to indicate the different components. (9)

2.2 List THREE advantages of a Lacto-type pressure reducing valve. (3)

2.3 Name FOUR disadvantages of an unbalanced hot-water installation. (4)

2.4 State ONE advantage and ONE disadvantage of a solar water-heating system (2)

2.5 Name TWO conditions that require venting in a stub stack installation. (2)

[20]

QUESTION 3: DRAINAGE

3.1 Draw a labelled flow diagram of the layout of a typical sewage purification plant. (10)

3.2 What is an *inspection eye*? (2)

3.3 Give the complete meaning of the following drainage abbreviations:

3.3.1 EW

3.3.2 WT

3.3.3 WM (3 × 1) (3)

3.4 A drain pipe has an invert depth of 625 mm at the change of direction.

Calculate the invert depth at the next change of direction if the distance between the two points is 8 m and the gradient of the drain is 1:35. (5)

Copyright reserved

3.5 A plan view of a domestic house with an outbuilding is shown on DIAGRAM SHEET 1 (attached).

Complete the underground drainage detail on the DIAGRAM SHEET with the aid of a single-line diagram which should indicate an effective economical sewage-disposal system. Use the one-pipe drain system (combined soil and waste water).

The following details must be clearly indicated:

Provision for ONE ventilation pipe
One gulley
Access to facilitate effective cleaning
One inspection eye

Drainage details labelled in accordance with the standard abbreviations.

NOTE: Hand in the completed DIAGRAM SHEET with the ANSWER BOOK. Ensure that your EXAMINATION NUMBER is written on the DIAGRAM SHEET. (15)
[35]

QUESTION 4: SHEET METAL WORK AND FLASHINGS

The drawing on DIAGRAM SHEET 2 shows two views of a conical transition piece truncated parallel to the base.

Develop the pattern in the ANSWER BOOK by means of the triangulation method.

Use scale 1:10. **[15]**

QUESTION 5: CALCULATIONS

The drawing on DIAGRAM SHEET 3 shows the hot- and cold-water layout of a domestic dwelling. The illustration must be completed with copper tubing and brass compression fittings.

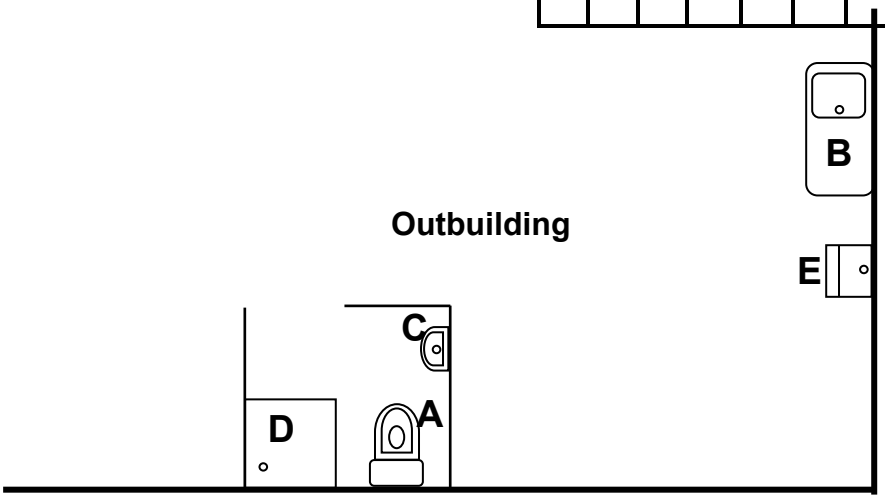
Draw up a list of the materials in the ANSWER BOOK, indicating the quantity of each item required to complete the water installation. Do not determine the quantities for the copper tubing and do not give the unit price per item. **[10]**

TOTAL: 100

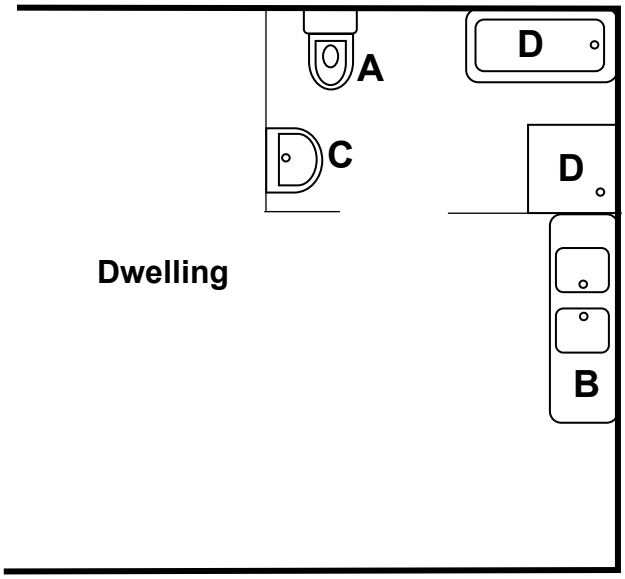
Copyright reserved

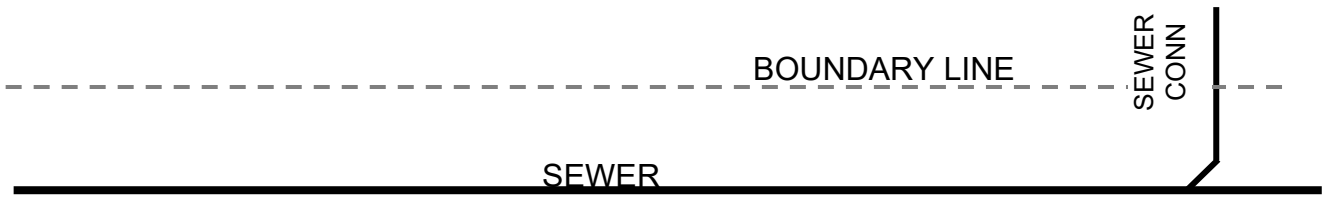
DIAGRAM SHEET 1

EXAMINATION NUMBER:



1	Water closet
2	Sink
3	Basin
4	Bath
5	Shower
6	Wash trough

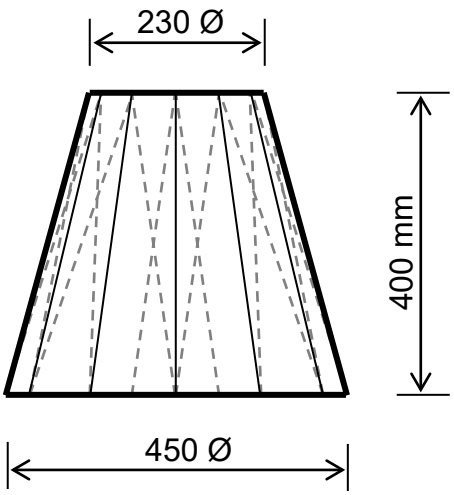




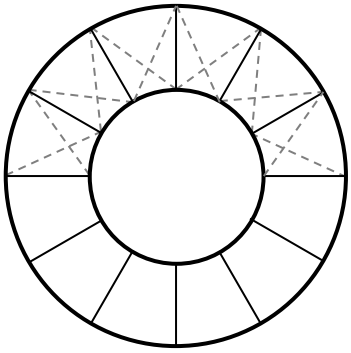
Copyright reserved

DIAGRAM SHEET 2

FRONT VIEW

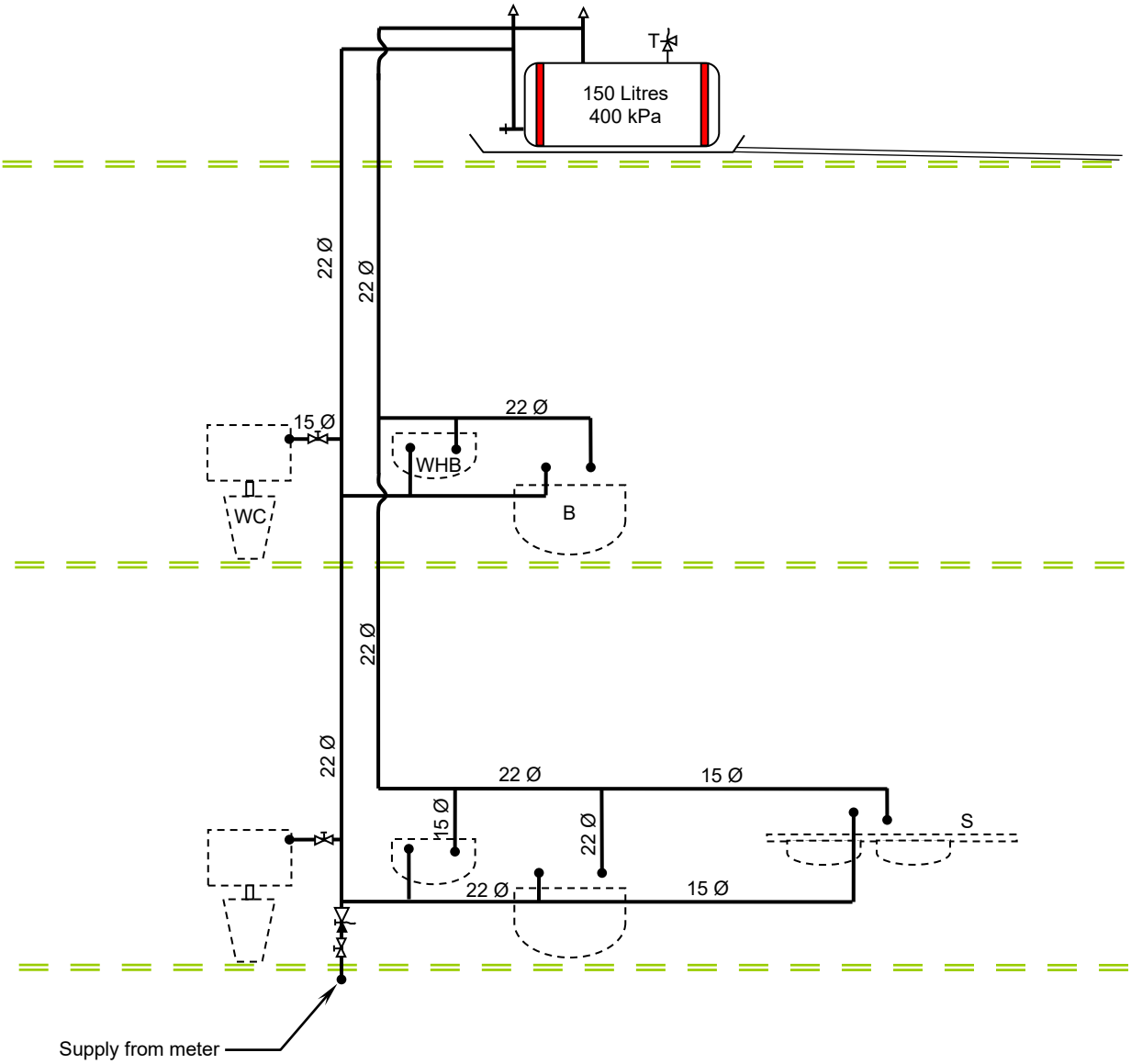


TOP VIEW



Copyright reserved

DIAGRAM SHEET 3



SCALE 1:50

Copyright reserved