higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE

PLUMBING THEORY N2

(11022052)

6 August 2021 (X-paper)
09:00–12:00

Drawing instruments and nonprogrammable calculators may be used.

This question paper consists of 5 pages and 1 diagram sheet.

229Q1G2106

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. Start each question on a new page.
5. Only use a black or blue pen.
6. Write neatly and legibly.

Copyright reserved

QUESTION 1: COLD-WATER SUPPLY

1.1 Indicate whether the following statements are TRUE or FALSE. Choose the correct answer and write only 'True' or 'False' next to the question number (1.1.1–1.1.10) in the ANSWER BOOK.

1.1.1 Permanent hard water is caused by the presence of sulphate of calcium and magnesium in the water.

1.1.2 Pressure or mechanical filter is a square tank with a diameter of approximately 1,2 m to 2,5 m with a spherical side and bottom.

1.1.3 A water reticulation system is a network of piping deep down under the street, varying in depth from 2 m to 1 m under street level.

1.1.4 Filtration is a process in the geyser that removes cold water from the pipes.

1.1.5 A pillar type hydrant gets water directly from the water reticulation network in the street.

1.1.6 A ball valve regulates the cold water from the geyser.

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

1.1.8 Sterilisation of water is when chlorine is added to the water to make water free from harmful bacteria and fit for human consumption.

1.1.9 A thermostatic valve is valve that forces cold water to rise to the geyser.

1.1.10 A wet pipe is a system where water is always present in the pipes and filled up to the sprinkler head.

(10 × 1) (10)

1.2 List FOUR acceptable quality requirements for water, that is intended for human consumption. (4)

1.3 What is meant by the term *pressure zone*? (2)

1.4 How would you best describe *temporary hardness* of water? (3)

1.5 Name ONE common impurity found in water. (1)

[20]

QUESTION 2: HOT-WATER SUPPLY

2.1 Make a neat, labelled sectional sketch of a typical push-through geyser, and show all the accompanying valves. (10)

2.2 Write the correct colour coding for the following water pressure ratings:

2.2.1 50 kPa (1)

2.2.2 400 kPa (1)

2.2.3 75 kPa (1)

2.3 Give THREE possible functions of a pressure control valve. (3)

2.4 List TWO advantages and TWO disadvantages of a Latco-type pressure reducing valve. (4)
[20]

QUESTION 3: DRAINAGE

3.1 List SIX aspects that the drainage inspector should check to ensure that it complies with the National Building Regulations. (6)

3.2 Write the following standard sanitary and miscellaneous abbreviations in full:

3.2.1 ABC

3.2.2 S

3.2.3 RE

3.2.4 G

3.2.5 ST

(5 × 1) (5)

3.3 Describe the function of the water seal in a trap. (3)

Copyright reserved

3.4 Design an effective drainage layout of the domestic dwelling shown on the given DIAGRAM SHEET. Label and describe all the pipes and fittings required to complete the installation.

Write your EXAMINATION NUMBER in the space provided and place the completed DIAGRAM SHEET in the ANSWER BOOK. (15)

3.5 Before a septic tank can be installed, the soil must be tested to ensure suitability for the French drain.

List SIX possible steps to describe the testing of the soil with reference to the excavation and preparation for the exercise. (6)
[35]

QUESTION 4: SHEET METAL WORK AND FLASHING

4.1 What are *flashings*? (2)

4.2 Show by means of a neat sketch how a flashing should be fixed against a parapet wall of a flat roof and label the parts. (8)

4.3 Give FIVE possible areas where flashings could be fitted on buildings. (5)
[15]

QUESTION 5: CALCULATIONS

5.1 A drain pipe is laid at a fall of 1:28 and has a length of 10 m between two changes of direction.

Calculate the invert level at the bottom end if the invert depth is 370 mm at the head of the pipe. (5)

5.2 Calculate the amount of material required to manufacture a water tank with a diameter of 1,3 m and a height of 900 mm. The tank is open at the top.

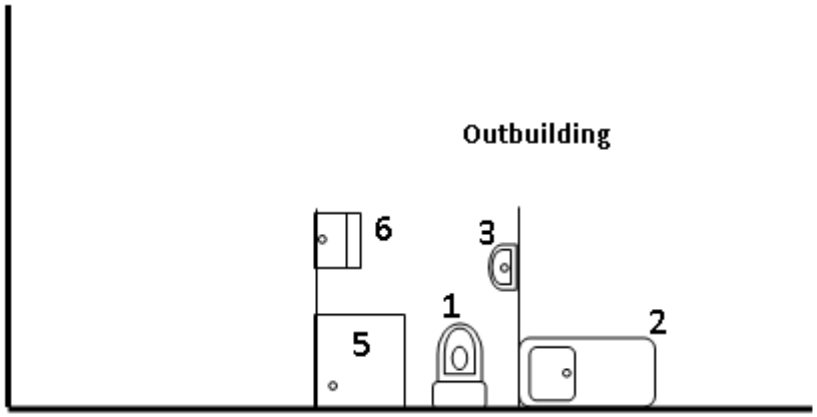
Do not make any allowance for seams. (5)
[10]

TOTAL: 100

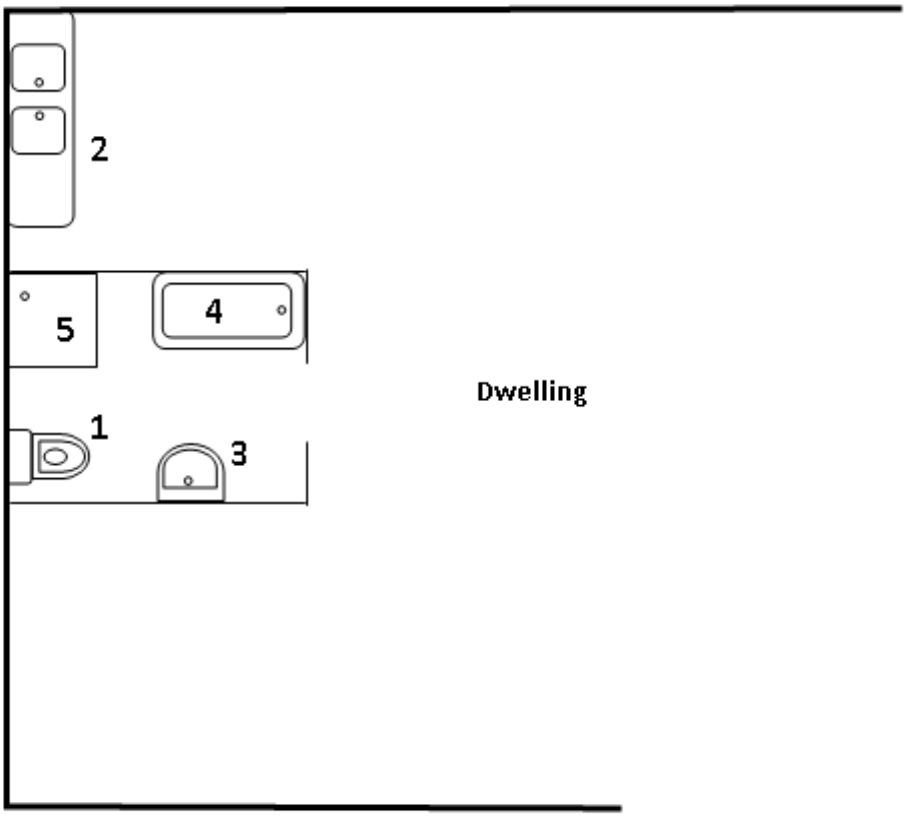
Copyright reserved

(11022052)

DIAGRAM SHEET EXAMINATION NUMBER:



1	Water Closet
2	Sink
3	Wash Hand Basin
4	Bath
5	Shower
6	Wash Trough





Copyright reserved