higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE

PLUMBING THEORY N2

(11022052)

24 November 2022 (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.

225Q1E2224

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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. Use only a blue or black pen.
5. The sketch should be neat, clear and fully labelled. A pencil may be used.
6. Write neatly and legibly.

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QUESTION 1: COLD-WATER SUPPLY

1.1 State TWO characteristics of soft water. (2)

1.2 State THREE purposes of a base exchanger. (3)

1.3 List the FOUR-STEP water treatment process for human consumption. (4)

1.4 What is the purpose of supply tanks and water towers in the reticulation process? (1)

1.5 Name FOUR types of fire hydrants. (4)

1.6 State FOUR advantages of pressure-reducing valves. (4)

1.7 State the purpose of an air-release valve when installed on a long run of water-supply pipe. (1 × 2) (2)

[20]

QUESTION 2: HOT-WATER SUPPLY

2.1 Name the colour coding used to identify the valves with the following pressure:

2.1.1 200 kPa

2.1.2 400 kPa

(2 × 1) (2)

2.2 Give TWO reasons why geysers are sometimes interconnected. (2)

2.3 State THREE disadvantages of a water solar-heating system as compared to an electric hot-water heating system. (3)

2.4 Draw a neat, fully labelled diagrammatic sketch of an electric hot-water heating installation with a horizontal geyser with a pressure rating of 400 kPa.

Clearly indicate all the required pipes and valves including the anti-syphon loop. (7)

2.5 Briefly describe the function of a pressure-relief valve when it is installed with a pressure-control valve in a closed or unvented hot-water installation. (4)

2.6 Give TWO reasons why back-syphonage should not be allowed to occur when it is fitted on the cold-water inlet to the geyser. (2)

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QUESTION 3: DRAINAGE

3.1 Name the TWO phases in which inspection and testing of drains are done. (2)

3.2 List FOUR advantages of using a one-pipe system in a building. (4)

3.3 State FIVE regulations that discharge or ventilation pipes should conform to. (5)

3.4 Name THREE circumstances that require a stub-stack sanitary pipework installation to be vented. (3)

3.5 What is meant by the term *one-pipe system* when referring to a sanitary pipe arrangement? (3)

3.6 Describe a method that could be used to protect the drain against damage. (2)

3.7 The DIAGRAM SHEET (attached) shows a two-pipe system of a three-storey building.

Answer the following questions with regard to the drawing on the diagram sheet:

3.7.1 How many storeys does the building have? (1)

3.7.2 How many 50 diameter pipes are utilised in the two-pipe system? (1)

3.7.3 Write the following abbreviations in full:

(a) LB

(b) GT

(2 × 1) (2)

3.7.4 State TWO disadvantages of a two-pipe system as shown in the diagram. (2)

3.8 A drainpipe has an invert depth of 660 mm at a change of direction.

Calculate the invert depth at the next change of direction if the distance between the two points is 13 m and the gradient of the drain is 1:40. (4)

3.9 Any drain installation must be provided with adequate access to the installation for the purpose of inspection, testing or internal cleaning.

Name SIX likely points where access to pipes should be provided. (6)

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QUESTION 4: SHEET-METAL WORK AND FLASHING

4.1	State what flashing is and the purpose for which it is used.	(2 × 1)	(2)
4.2	Name SIX types of flashing.		(6)
4.3	List FIVE types of metals that can be used to make flashing.		(5)
4.4	Name TWO places in a building where flashing is utilised.		(2)

[15]

QUESTION 5: CALCULATIONS

A tank with a base of 1 350 mm × 1 500 mm and a height of 1 400 mm is used to store water. The tank is open at the top and the density of water is 1 000 kg/m³.

5.1	Calculate the maximum volume in cubic metres that the tank can hold.	(2)
5.2	Calculate the mass of the water and the tank when the tank is full of water. The tank has a mass of 120 kg when it is empty.	(4)
5.3	Calculate the area of the material in square metres required to manufacture the tank. Do not make any allowances for seams or wire edges.	(4)

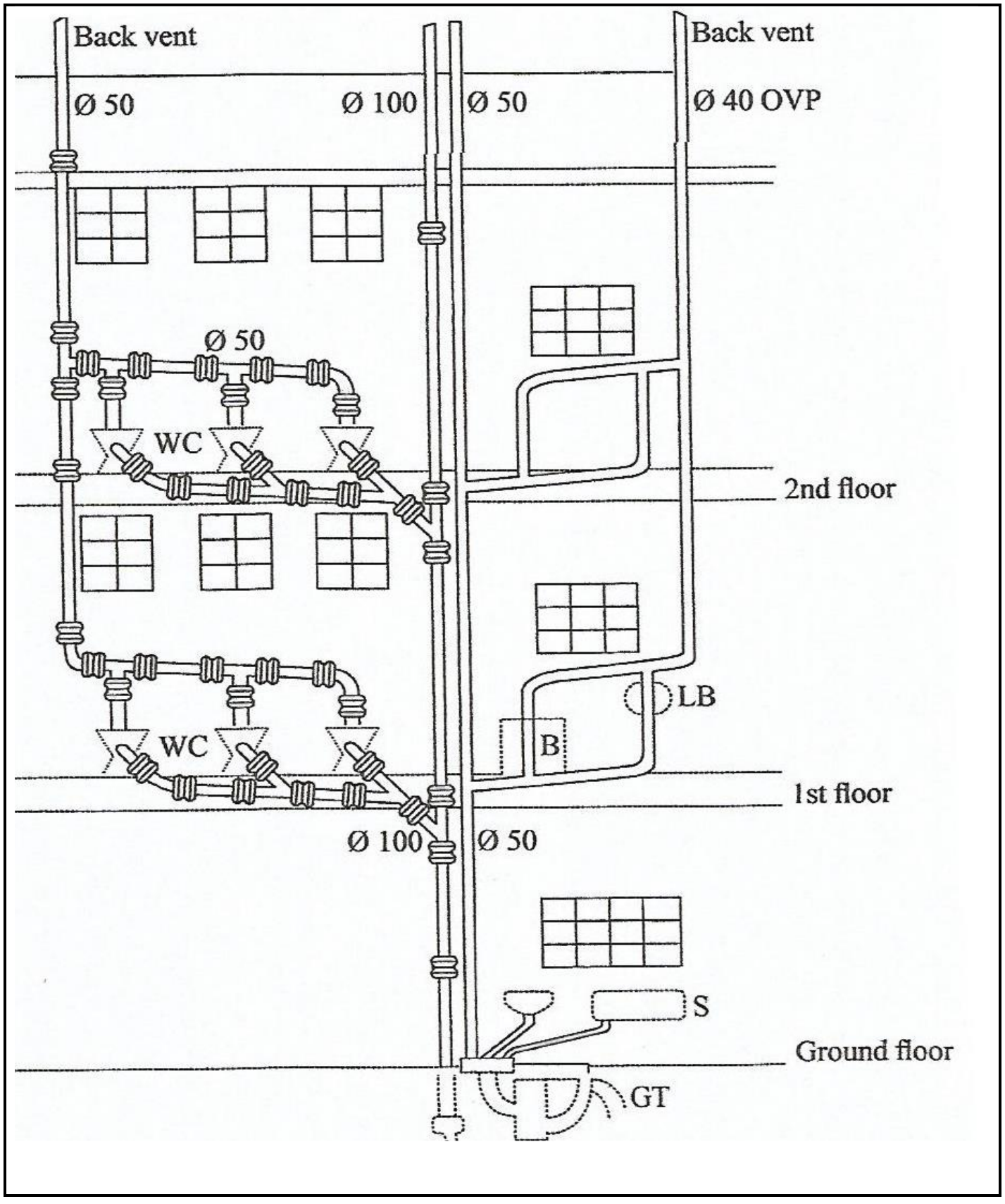
[10]

TOTAL: 100

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DIAGRAM SHEET



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