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higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

T1370(E)(M26)T
APRIL EXAMINATION

NATIONAL CERTIFICATE

PLUMBING THEORY N2

(11022052)

26 March 2013 (X-Paper)
09:00–12:00

Candidates will require drawing instruments.

Calculators may be used.

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

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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. QUESTION 3.6 and QUESTION 4 must be answered on DIAGRAM SHEET 1 and DIAGRAM SHEET 2 (attached).
5. All the sketches and/ or diagrams must be done in pencil. They must be neat, reasonably large, in proportion and fully labelled.
6. ALL abbreviations and symbols MUST comply with the latest National Building Regulations and ALL relevant SANS codes.
7. Rule off across the page on completion of EACH question.
8. Write neatly and legibly.

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QUESTION 1: COLD WATER SUPPLY

1.1 Describe what is meant by each of the following terms:

1.1.1 Temporary hard water (3)

1.1.2 Permanent hard water (3)

1.2 List FIVE types of impurity commonly found in water. (5)

1.3 Briefly discuss THREE advantages of the gravity system of supplying water to the consumer compared to a pumped system with supply tanks and water towers. (6)

1.4 What is the primary function of a fire hydrant? (3)
[20]

QUESTION 2: HOT-WATER SUPPLY

2.1 Give THREE reasons why geysers are sometimes interconnected. (3)

2.2 Name the colour codes used to identify each of the following pressure control valves:

2.2.1 100 kPa (1)

2.2.2 400 kPa (1)

2.2.3 600 kPa (1)

2.3 Draw a neat, fully labelled, single-line diagram of a hot-water installation with a vertical electric geyser of 150 litre and a pressure rating of 400 kPa. Arrange the pipe work to allow for a balanced cold and hot water system.

Indicate all the required valves, pipes and fittings. Make use of symbols as specified by the relevant SANS codes. (9)

2.4 Old boilers and hot-water cylinders are sometimes clogged up with salt deposits.

Briefly explain where these salts come from. (5)
[20]

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QUESTION 3: DRAINAGE

3.1 The National Building Regulations state that 'no person shall put into use any drainage installation before such installation has been inspected, tested and passed by the local authority or inspector to ensure that it complies with the regulations'.

List FIVE aspects that any drainage installation must comply with when inspected by the local authority or drainage inspector. (5)

3.2 When conducting a hydraulic test on a drain, the level of the water in the standpipe may drop.

Name TWO possible causes that may lead to this problem. (2)

3.3 After any drainage installation has been completed and partly back-filled the drains shall be tested for leaks.

Describe how the duration (time) and the air pressure in the stand will affect the outcome of an air pressure test on the drainage installation. (4)

3.4 Name TWO factors that need to be considered when planning the placing (positioning) of a conservancy tank to be used for the reception of sewage from a dwelling. (4)

3.5 The invert level of a drain is 550 mm at the head of the drain. The first section of pipe is 11,5 m long, and has a gradient of 1 : 24.

Calculate the invert depth at the first change of direction in the drain. (2)

3.6 FIGURE 1 on DIAGRAM SHEET 1 shows the plan view of a domestic dwelling with an outbuilding in a rural area. The sewage must be conveyed to the septic tank and French drain.

3.6.1 Use the attached DIAGRAM SHEET to design, in single lines and in accordance with the relevant regulations, an underground drainage layout for the sewage disposal system. (8)

3.6.2 Show the following details:

(a) One gulley (2)

(b) One ventilation pipe (2)

(c) Adequate access to the drain (2)

(d) Standard abbreviations for FOUR sanitary fitments (2)

(e) Standard abbreviations for FOUR drainage details (2)

NOTE: Write your examination number in the space provided and place the completed DIAGRAM SHEET in the ANSWER BOOK.

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[35]

QUESTION 4: SHEET-METAL WORK AND FLASHING

FIGURE 2 on DIAGRAM SHEET 2 (attached) depicts two views of a conical transition piece truncated parallel to the base.

Develop, on the same sheet, the full pattern of the transition piece by means of TRIANGULATION.

NOTE: Write your examination number in the space provided and place the completed DIAGRAM SHEET in the ANSWER BOOK. **[15]**

QUESTION 5: CALCULATIONS

FIGURE 3 on DIAGRAM SHEET 3 (attached) shows a hot- and cold-water layout of a domestic dwelling. The installation is to be completed with copper tubing and brass compression fittings.

Determine the quantities of material required to complete the water installation. Use the plan lengths to determine the quantities for the copper tubing. **[10]**

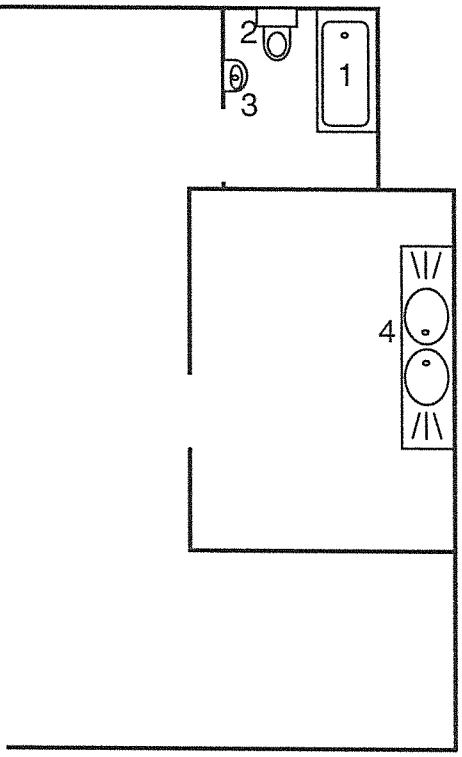
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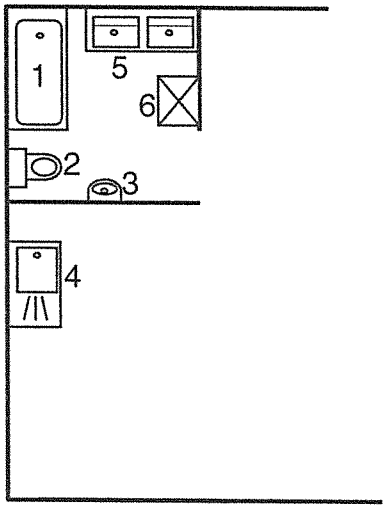
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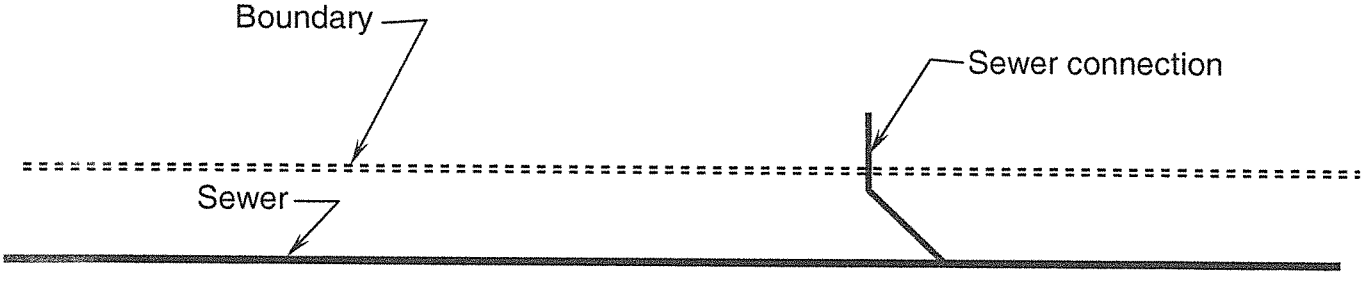
DIAGRAM SHEET 1

EXAMINATION NUMBER:

1	Bath	
2	Water closet	
3	Wash basin	
4	Sink	
5	Wash trough	
6	Washing machine	







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DIAGRAM SHEET 2

EXAMINATION NUMBER:

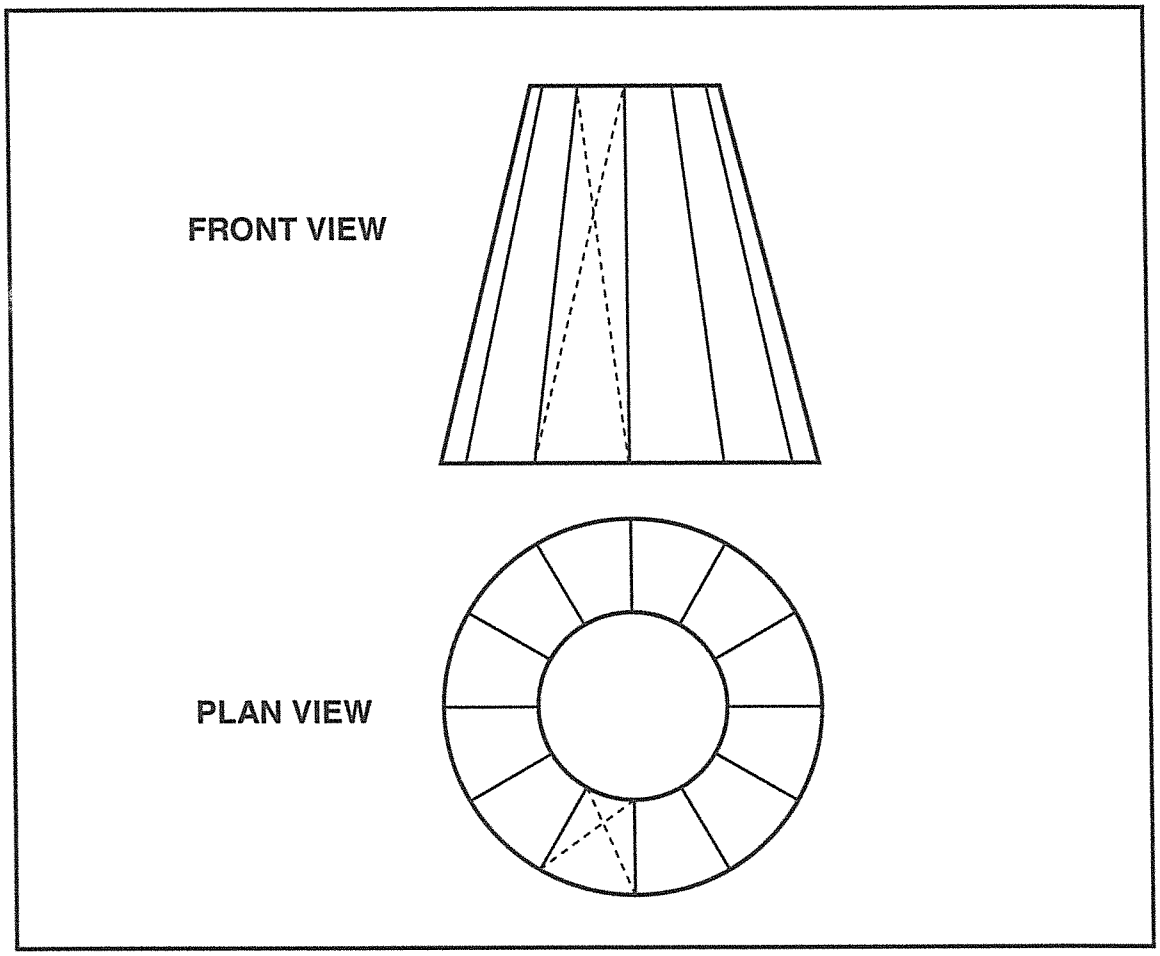


FIGURE 2

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DIAGRAM SHEET 3

NOTE:

- All branch pipes to terminal points are 15 Ø except to the baths that are fed from 22 Ø pipes.
- Use copper pipes with compression fittings.

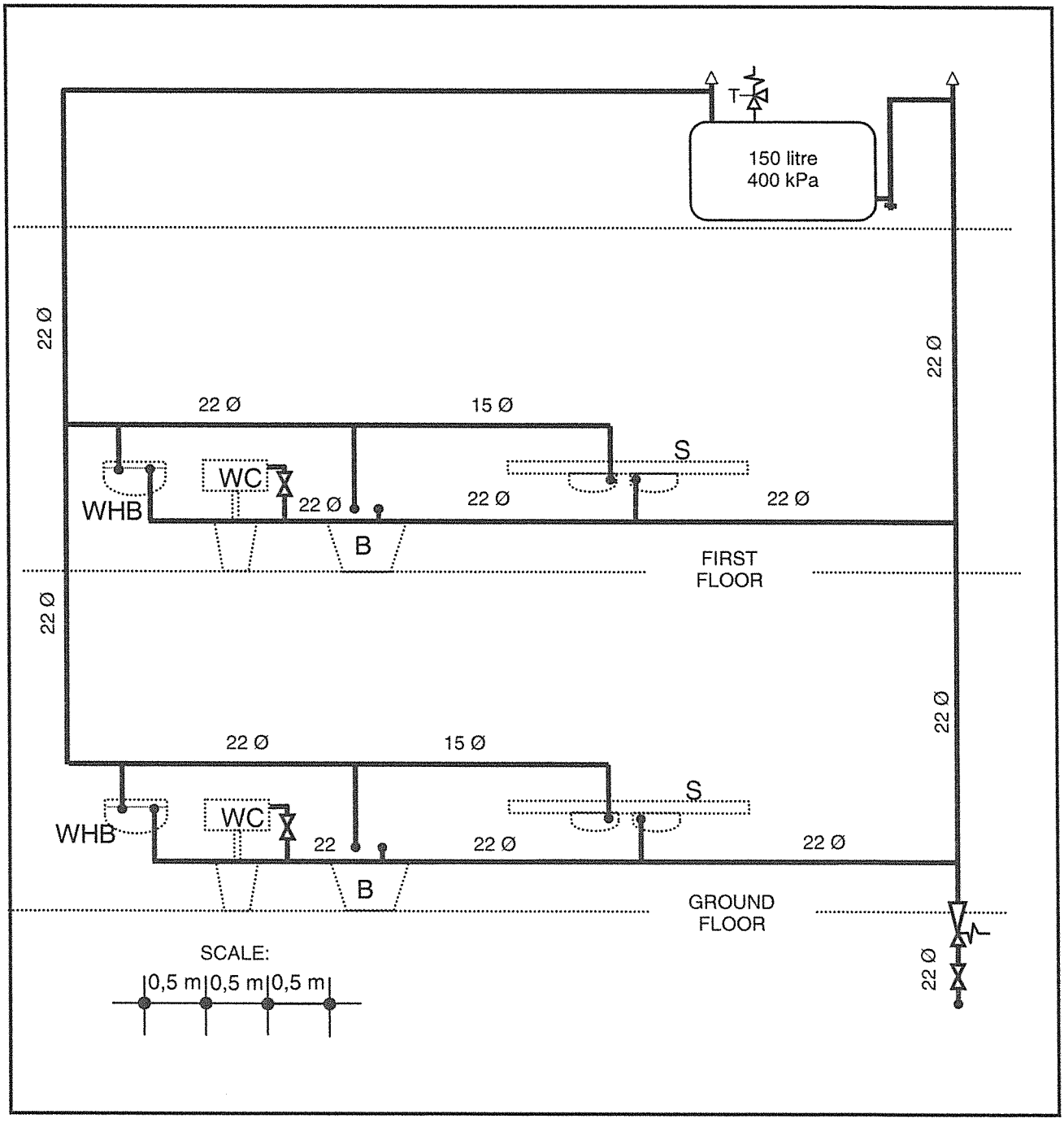


FIGURE 3

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