higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

T1290(E)(A17)T
APRIL EXAMINATION

NATIONAL CERTIFICATE

PLUMBING THEORY N2

(11022052)

17 April 2015 (Y-Paper)
13:00–16:00

Candidates will require drawing instruments.

Calculators may be used.

This question paper consists of 5 pages and 2 diagram sheets.

ENGINEERING

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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. ALL the questions must be done in the ANSWER BOOK, except QUESTION 3.4 and QUESTION 4 which must be answered on DIAGRAM SHEET 1 (attached) and DIAGRAM SHEET 2 (attached) respectively.
5. All the sketches and/or diagrams must be neat, reasonably large, in good proportion, fully labelled and done in pencil.
6. ALL the abbreviations and symbols must comply with the latest National Building Regulations and ALL relevant SANS (SABS) codes.
7. Rule off across the page on completion of EACH answer.
8. Write neatly and legibly.

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QUESTION 1: COLD-WATER SUPPLY

1.1 Describe the following terms:

1.1.1 Temporary hard water

1.1.2 Permanent hard water

(2 × 3) (6)

1.2 What is the purpose of an air-release valve when installed on a long run of water supply pipe? (2)

1.3 The primary function of a fire hydrant is to provide easy access to an abundant water supply, at a reasonably high pressure. It is however also used for other purposes.

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

1.4 Name THREE advantages of the gravity system of water supply to the consumer as compared to the pumped system of water supply to supply tanks and water towers. (3)

1.5 Describe the chemical reaction that occurs during the process of boiling temporary hard water. (6)
[20]

QUESTION 2: HOT-WATER SUPPLY

2.1 Make a neat, fully labelled diagrammatic sketch of an electrical 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 antisyphon loop. Ignore the safety/drip tray. (7)

2.2 Old boilers and hot-water cylinders are usually clogged with salt deposits.

Describe how these salt deposits are formed giving at least THREE facts. (3)

2.3 Describe, with the aid of a simple sketch, how the expansion of the hot water is relieved (during the heating process) in the combination hot-water geyser. (6)

2.4 Briefly describe the function of a pressure-relief valve when it is installed with a pressure-control valve in a closed (unvented) hot-water installation. (4)
[20]

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QUESTION 3: DRAINAGE

3.1 Describe the following drainage terms:

3.1.1 Drainage installation (3)

3.1.2 Rodding eye (2)

3.1.3 Manhole (2)

3.1.4 Septic tank (3)

3.2 Make a neat single-line longitudinal, sectional sketch of a typical conservancy tank (vacuum tank) suitable for a domestic dwelling. Clearly indicate and label all the required detail, pipes, fittings and dimensions on the drawing. (6)

3.3 The invert level of a drain is 625 mm at the head of the drain.

Calculate the invert depth at the first change of direction in the drain. The first section of pipe is 12, 75 m long and the drain has a gradient of 1 : 26. (4)

3.4 Design an effective drain layout for the plan view of the domestic dwelling shown on DIAGRAM SHEET 1 (attached). 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 1 in the ANSWER BOOK. (15)
[35]

QUESTION 4: SHEET-METAL WORK AND FLASHING

The figure on DIAGRAM SHEET 2 shows a pipe with a diameter of 200 mm, intersected at an angle of 45° by a branch pipe with a diameter of 300 mm.

Draw the required elevation and develop the full pattern of the branch pipe as well as the pattern of the hole in the main pipe.

Do not show any allowance for seams. Use scale 1 : 10.

Write your EXAMINATION NUMBER in the space provided and place the completed DIAGRAM SHEET 2 in the ANSWER BOOK. **[15]**

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QUESTION 5: CALCULATIONS

A water supply tank has a base area of 1,2 m by 1,2 m with a height of 900 mm. The overflow outlet is 200 mm from the top of the tank.

Calculate:

5.1 The maximum volume of water that the tank can hold (3)

5.2 The mass of the tank if it is full of water
(The mass of the empty tank is 250 kg.) (4)

5.3 The total area of material (in m^2) required to manufacture the tank. Ignore any allowance for seams or a lid. (3)
[10]

TOTAL: 100

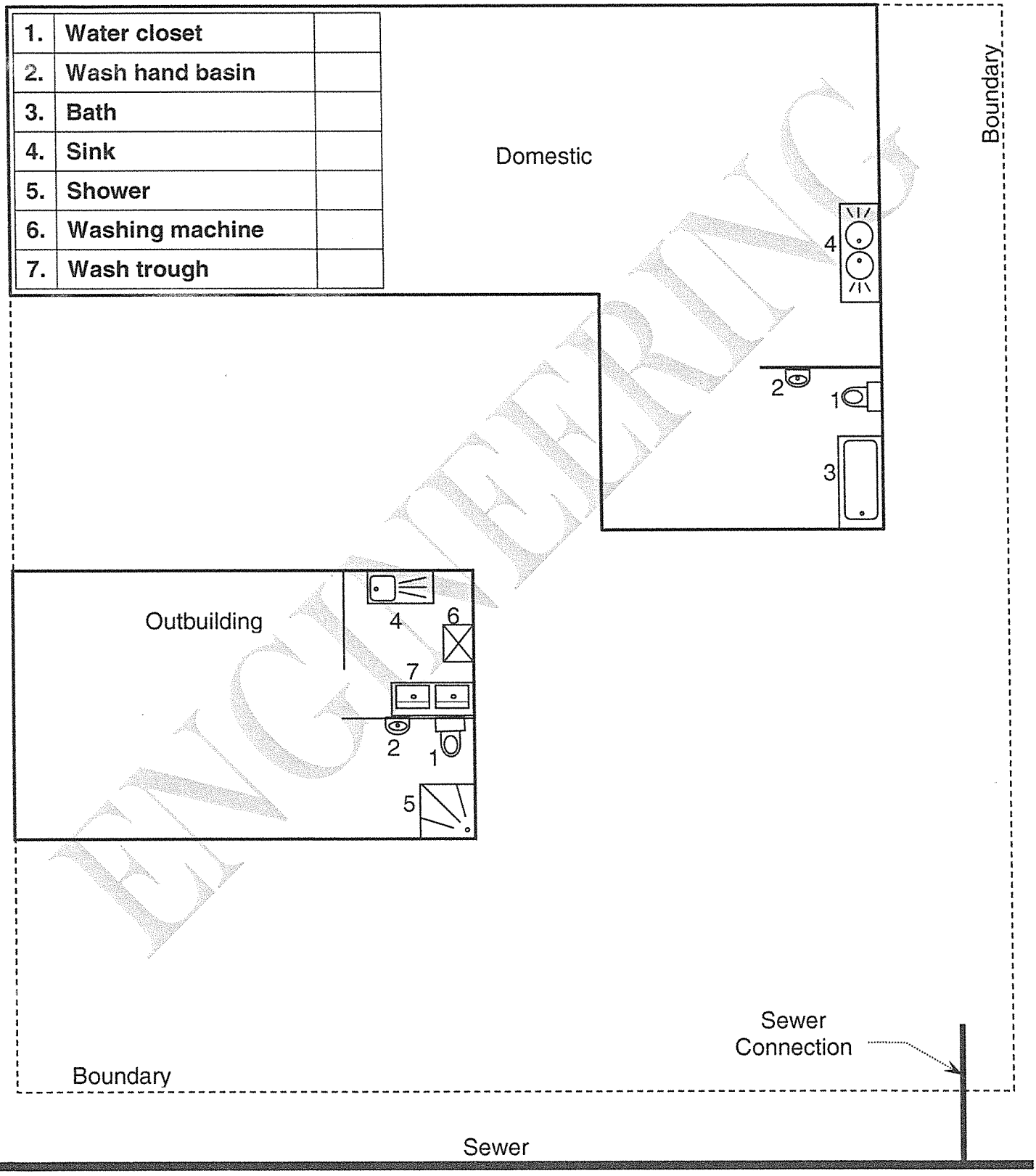
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DIAGRAM SHEET 1

EXAMINATION NUMBER:

1.	Water closet	
2.	Wash hand basin	
3.	Bath	
4.	Sink	
5.	Shower	
6.	Washing machine	
7.	Wash trough	

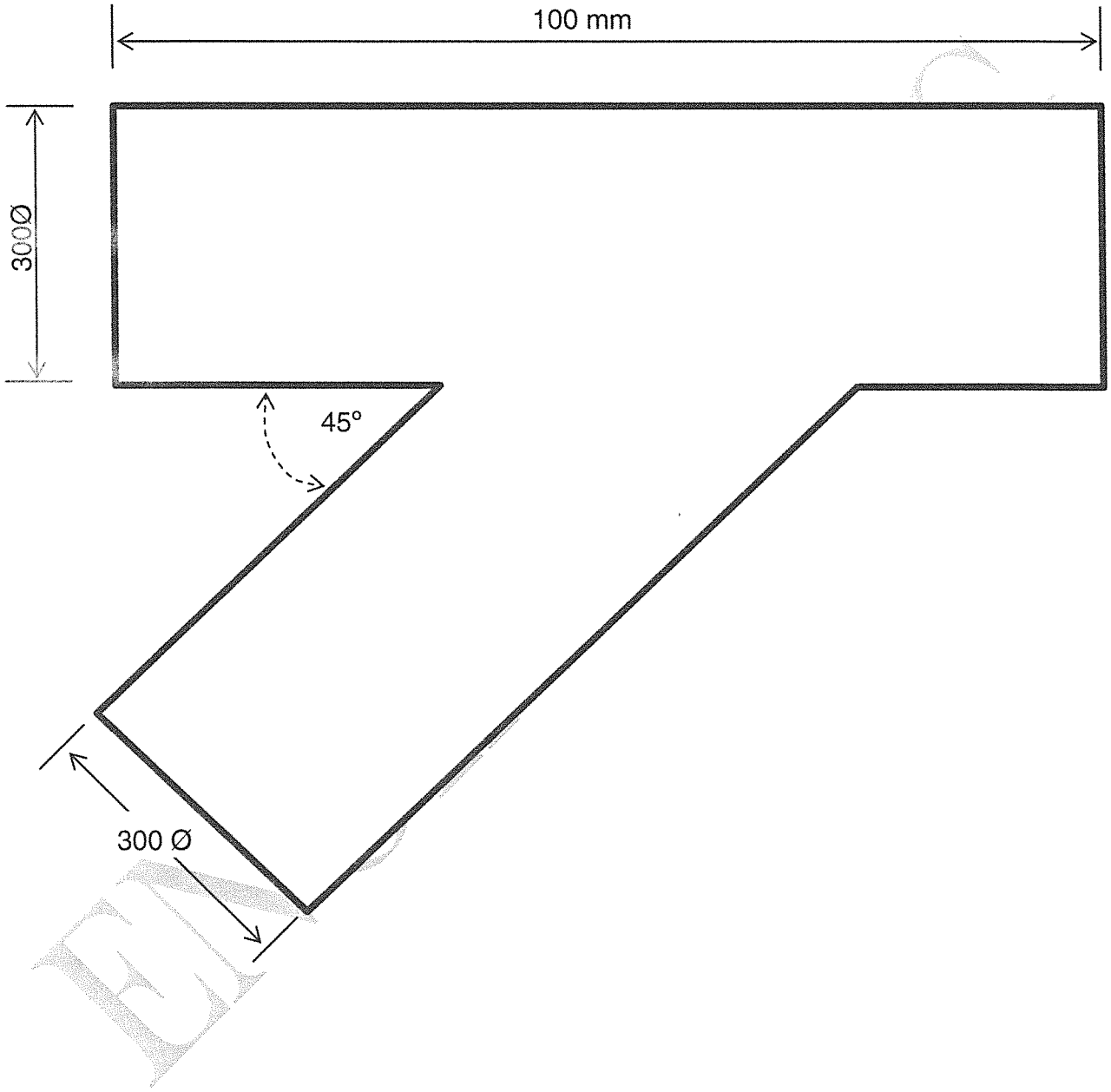


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DIAGRAM SHEET 2

EXAMINATION NUMBER:



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