higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

T1380**(E)**(A6)T

NATIONAL CERTIFICATE

PLUMBING THEORY N2

(11022052)

6 August 2019 (X-Paper)
09:00–12:00

This question paper consists of 5 pages and 2 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. Sketches must be large, neat and fully labelled.
5. Write neatly and legibly.

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QUESTION 1: COLD-WATER SUPPLY

1.1 In the process of water purification, the water goes through several stages such as coagulation, sedimentation, filtration and chlorination before it is fed to service reservoirs.

Keep the above statement in mind and give THREE reasons why service reservoirs are used for the storage of potable water. (3)

1.2 State THREE types of impurities commonly found in water. (3)

1.3 Describe the following water purification stages:

1.3.1 Coagulation (2)

1.3.2 Sedimentation (2)

1.3.3 Filtration (2)

1.3.4 Chlorination (2)

1.4 Water hammer can sometimes be heard in water pipes.

1.4.1 State THREE causes of water hammer. (3 × 1) (3)

1.4.2 State THREE remedies of water hammer. (3 × 1) (3)
[20]

QUESTION 2: HOT-WATER SUPPLY

2.1 List THREE functions of a pressure-control valve in a hot-water installation. (3)

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

2.2.1 200 kPa (1)

2.2.2 400 kPa (1)

2.3 Give THREE advantages of using a high-pressure geyser. (3)

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

2.5 Show, with the aid of a neat sketch how the expansion of hot water is relieved (during the heating process) in the combination hot-water geyser. (10)
[20]

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QUESTION 3: DRAINAGE

3.1 How can you best describe the term *drainage installation*. Give THREE facts. (3)

3.2 Make a neat, labelled, longitudinal sectional sketch of a conservancy (vacuum) tank. (10)

3.3 A drain pipe has an invert depth of 550 mm at a change of direction.

Calculate the invert depth at the next change of direction if the distance between the two points is 11 m and the gradient of the drain is 1:40. (4)

3.4 Name THREE important design aspects, that should be kept in mind when planning a drain layout. (3)

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

Use the diagram sheet and design in single lines, in accordance with the relevant regulations, an underground drainage layout for the sewage disposal system.

Clearly indicate the following drainage details:

- One gulley
- One ventilation pipe
- Adequate access to the drain
- Standard abbreviations for any THREE sanitary fitments
- Standard abbreviations for any THREE drainage details

Use the diagram sheet (attached) and complete and label the drain details to the septic tank and French drain to ensure effective disposal of the sewage.

NOTE: 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

DIAGRAM SHEET 2 shows two views of a square to round transition piece. The position of the seam is indicated on the top view.

Draw, by means of the triangulation method, the full pattern of the transition piece. Do not show any allowances for seams.

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

QUESTION 5: CALCULATIONS

A tank with a base of 1 000 mm × 1 200 mm and a height of 1 500 mm is used to store water.

Calculate:

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

5.2 The mass of the water and the tank when the tank is full of water. The tank has a mass of 130 kg when it is empty. (4)

5.3 The area of the material (in m^2) required to manufacture the tank. Do not make any allowances for seams or wire edges. (3)

NOTE: The tank is open at the top and the density of water is 1 000 kg/m^3.

[10]

TOTAL: 100

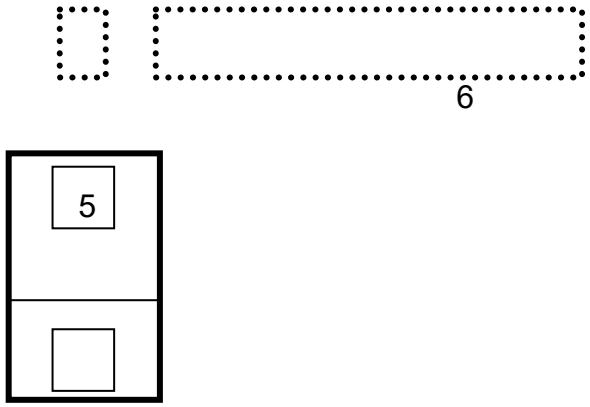
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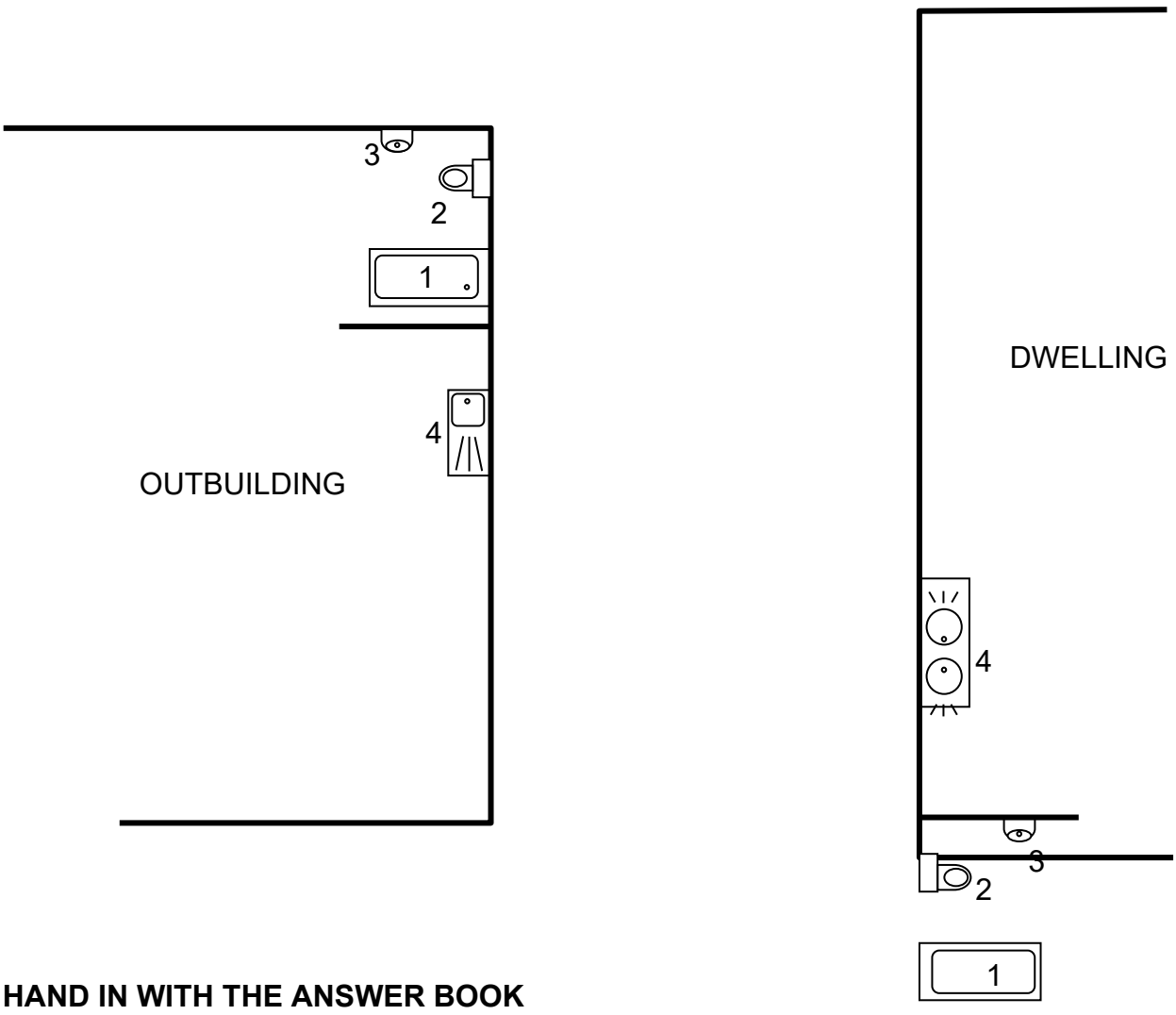
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DIAGRAM SHEET 1

QUESTION 3.5

1.	Bath	
2.	Water closet	
3.	Wash hand basin	
4.	Sink	
5.	Septic tank	
6.	French drain	





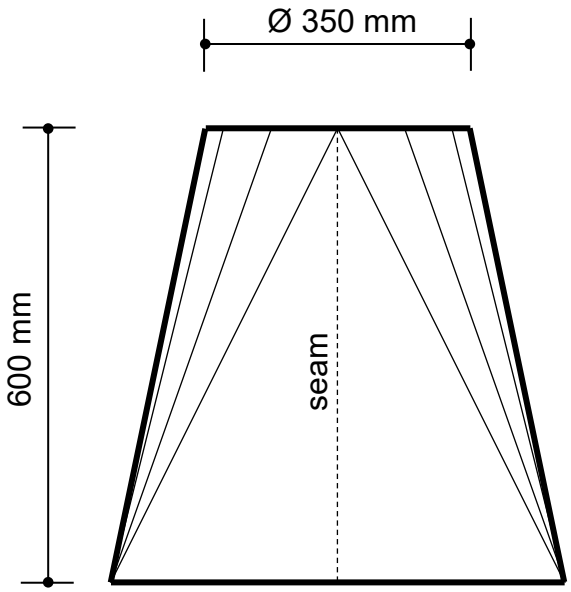
HAND IN WITH THE ANSWER BOOK

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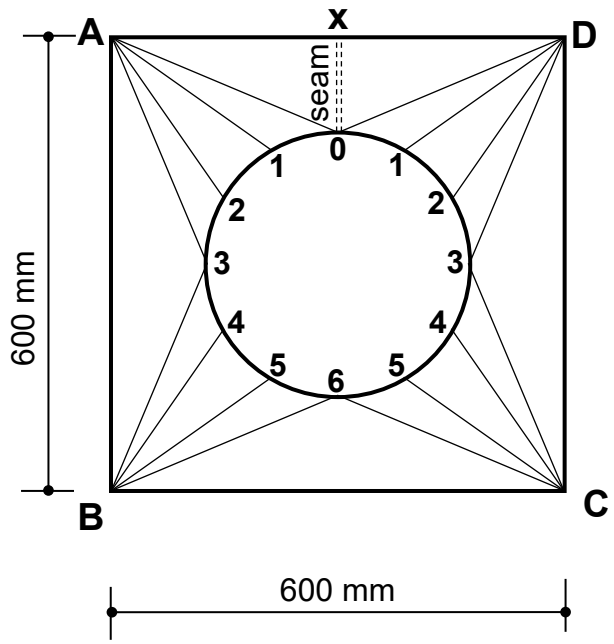
DIAGRAM SHEET 2

QUESTION 4

Side View



Top View



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