higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

T1400(E)(M24)T
APRIL 2011

NATIONAL CERTIFICATE

PLUMBING THEORY N2

(11022052)

24 March (X-Paper)
09:00 – 12:00

Calculators may be used.

Candidates will require drawing instruments, pen and a ruler.

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

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. ALL questions, except for QUESTION 3.5 which must be answered on DIAGRAM SHEET 1 (attached) must be done in the ANSWER BOOK.
4. ALL sketches and/ or diagrams must be done in pencil, be neat, reasonably large, in proportion and fully labelled.
5. ALL the abbreviations and symbols must comply with the latest National Building Regulations and ALL relevant SANS-codes.
6. Rule off across the page on completion of each question.
7. Number the answers correctly according to the numbering system used in this question paper.
8. Write neatly and legibly.

QUESTION 1: COLD WATER SUPPLY

1.1 Name FIVE common impurities found in untreated water. (5)

1.2 When water is being purified for human consumption, it undergoes a filtration process through a rapid sand filter.

1.2.1 What causes the water level in this filter to rise and the filtration rate to drop? (2)

1.2.2 The filtering media needs cleaning by means of backwashing. Briefly explain this process. (4)

1.3 State TWO advantages of the pillar type fire hydrant as compared to the underground type. (2)

1.4 Describe what is meant by the term *pressure zone* in the distribution and reticulation of water to the consumer. (3)

1.5 Name the flow rate and accompanying pressure value for each of the following as stipulated by the National Building Regulations:

1.5.1 Fire-hose reels (2)

1.5.2 Fire-hydrants (2)
[20]

QUESTION 2: HOT-WATER SUPPLY

2.1 Make a neat, labelled sectional sketch of a typical push-through geyser. Also show all the accompanying valves. (9)

2.2 Briefly explain the working principle of a temperature and pressure safety valve when it comes into operation (temperature action only.) (5)

2.3 Pressure control/reducing valves are colour coded to identify their various nominal working pressures. Write the correct colour coding for the following water pressure ratings:

2.3.1 100 kPa (1)

2.3.2 400 kPa (1)

2.4 Briefly explain FOUR functions of a vacuum breaker installed on the cold water inlet, and the hot-water outlet side of a hot-water geyser. (4)
[20]

QUESTION 3: DRAINAGE

3.1 The National Building Regulations prescribe 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 regulation. Name FOUR aspects that the drainage inspector should inspect. (4)

3.2 Before a septic tank can be installed, the soil must be tested for suitability for the accompanying french drain. Describe the in-situ permeability test of the soil with reference to the excavation and preparation for the test. (6)

3.3 The regulations prescribe that any underground drain should have a backfilling (soil cover) of at least 300 mm. However, if the backfilling (soil cover) is less than 300 mm, special precautions must be applied. Describe one of the methods that could be used to protect the drain against damage. (3)

3.4 Make a neat single-line longitudinal sectional proportional drawing of a typical septic tank suitable for a domestic dwelling. Clearly indicate and label all the required detail, pipes, fittings and dimensions on the drawing. (7)

3.5 Complete the plan layout on DIAGRAM SHEET 1 (attached) and indicate all the drainage detail required to ensure an effective and economical sewage disposal to the sewer. Label all the required access fittings, junctions and relevant pipe sizes. (15)

NOTE: Make sure that your EXAMINATION NUMBER is written on the DIAGRAM SHEET 1 and submit it with the ANSWER BOOK. **[35]**

QUESTION 4: SHEET METAL WORK AND FLASHING

4.1 State THREE methods used to develop sheet metal patterns. (3)

4.2 DIAGRAM SHEET 2 (attached) shows the front view of a branch pipe that intersects a main pipe at an angle of 45°.

4.2.1 Draw the given view in the ANSWER BOOK (2)

4.2.2 Complete the left view (3)

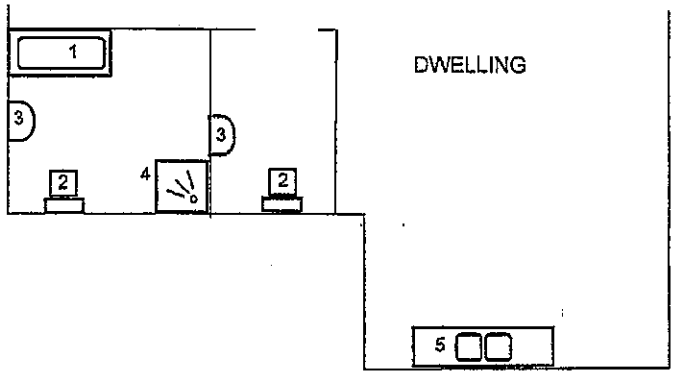
4.2.3 Determine the curve of interpenetration of the front view (3)

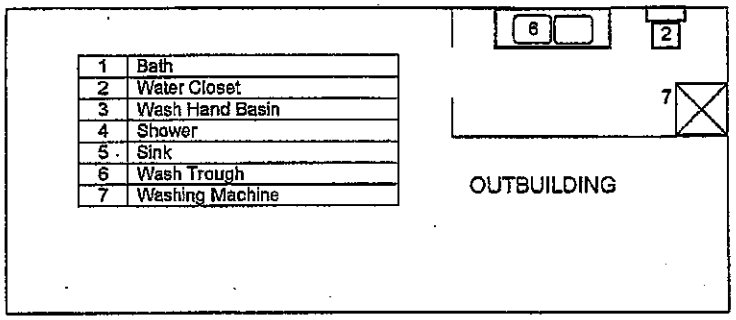
4.2.4 Develop the pattern of the shape of the hole in the main pipe only

Use scale 1 : 10 (4)
[15]

DIAGRAM SHEET 1

QUESTION 3.5 **EXAMINATION NUMBER:**





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

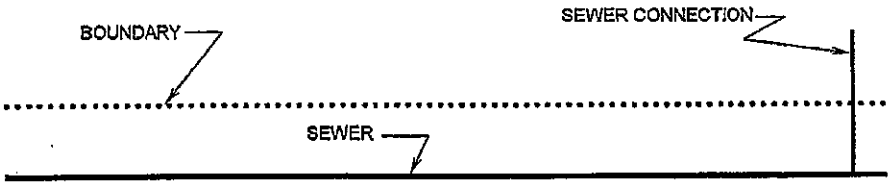


DIAGRAM SHEET 2