higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE

BUILDING AND CIVIL TECHNOLOGY N3

(11010273)

19 April 2021 (X-paper)
09:00–12:00

Nonprogrammable calculators and drawing instruments may be used.

This question paper consists of 5 pages.

225Q1A2119

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DEPARTMENT OF HIGHER EDUCATION AND TRAINING
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE
BUILDING AND CIVIL TECHNOLOGY N3
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 black or blue pen.
5. Write neatly and legibly.

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QUESTION 1

1.1 State FOUR general duties of employees at work under the Occupational Health and Safety Act. (4)

1.2 Describe the management procedures with regard to:

1.2.1 Leadership

1.2.2 Planning

1.2.3 Communication

(3 × 2) (6)

1.3 State SIX functions and responsibilities of a contractor in building construction. (6)

[16]

QUESTION 2

2.1 Name FOUR types of foundations. (4)

2.2 State FOUR procedures that have to be performed before any underpinning may be carried out. (4)

2.3 Make a large, neat, labelled sketch of a pipe level (U-tube). (8)

[16]

QUESTION 3

3.1 State FOUR factors that influence the hardening and strength of a concrete mixture. (4)

3.2 How much water is needed in litres if 600 kg of cement has to be mixed with a water/cement ratio of 0,5? (3)

3.3 Name FIVE types of cement. (5)

3.4 State THREE matters of crucial importance during the transport process of concrete from the plant to its destination. (3)

3.5 Which test would you use to determine the workability of concrete? (1)

[16]

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QUESTION 4

4.1 Complete the following sentences by writing only the missing words next to the question number (4.1.1–4.1.6) in the ANSWER BOOK.

The strength grades determined visually vary from 4.1.1 … to 4.1.2 … and 4.1.3 …

The mechanically tested strength grades are indicated as 4.1.4 …, 4.1.5 … and 4.1.6 … (6)

4.2 The combination electric geyser has a built-in cold-water storage tank, which is automatically controlled by a ball valve that regulates the incoming supply directly from the mains.

Make a large, neat sketch of a combination geyser and name EIGHT parts. (10)
[16]

QUESTION 5

5.1 State FOUR steps in preparing and painting a steel surface. (4)

5.2 State when would each of the following floor coverings be used:

5.2.1 PVC tiles

5.2.2 Thermoplastic tiles

5.2.3 Granolithic floors

(3 × 1) (3)

5.3 Make a neat, labelled sketch of a one-way switch with one light. (6)

5.4 What is electricity? (3)
[16]

QUESTION 6

6.1 Briefly explain the road buildings:

6.1.1 Formation

6.1.2 Subbase

6.1.3 Wearing course

6.1.4 Base course

(4 × 2) (8)

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6.2 A one-brick wall has to be built. The length of the wall should be 15 m and the height should be 2,7 m. The wall should have a door opening of 2 m high and 1 m wide and there should be a window opening of 2 m wide and 1, 5 m in length. The labour cost would be R100/ m^2

NOTE: ½ brick walling = 50 bricks/ m^2
1 m^3 sand = 1 000 kg (1 tonne)

Length of wall = 15 m
Height of wall = 2,7 m
Door opening = 2 × 1 m
Window opening = 2 × 1,5 m

Calculate the following:

6.2.1 The area of the wall (6)

6.2.2 Number of bricks required (2)

6.2.3 Amount of sand required (2)

6.2.4 Labour cost (2)
[20]

TOTAL: 100

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