



**DEPARTMENT OF HIGHER EDUCATION AND TRAINING**  
**REPUBLIC OF SOUTH AFRICA**  
NATIONAL CERTIFICATE  
BUILDING AND CIVIL TECHNOLOGY N3  
TIME: 3 HOURS  
MARKS: 100

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**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 should be neatly and clearly labelled.
  5. Your understanding of the subject is what is important NOT reproduction of the study material.
  6. Start each question on a NEW page.
  7. Write neatly and legibly.
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**QUESTION 1**

Indicate whether the following statements are TRUE or FALSE. Choose the answer and write only 'true' or 'false' next to the question number (1.1–1.10) in the ANSWER BOOK.

- 1.1 One of the duties of the site supervisor is to make regular visits to the site and work closely with the site staff.
- 1.2 The joiner checks that timber is of the quality specified.
- 1.3 The primary function of planning in the building industry is to make the most efficient and economical use of labour, machines, materials, and methods.
- 1.4 The contract manager checks that the timber is of the quality specified.
- 1.5 The local authority has to ensure that the work is carried out in accordance with the plan and wishes of the architect.
- 1.6 The conditions of employment of a company can stipulate when to report for duty and when to go off duty.
- 1.7 The contractor is employed by the building owner on the architect's advice to carry out the construction work.
- 1.8 The general duties of the employers are to maintain and provide an environment that is unsafe and dangerous to the well-being of the employees.
- 1.9 Dismissal means that an employer refused to allow an employee to resume work after she took maternity leave in terms of any law, collective agreement or her contract of employment.
- 1.10 The clerk of works checks the quality of the workmanship as the job progresses.

(10 × 1)

**[10]****QUESTION 2**

- 2.1 Explain the term *foundation*. (3)
- 2.2 State FIVE tasks that have to be performed before any underpinning may be carried out. (5 × 1) (5)
- 2.3 The pad or isolated foundation is used to support the load from piers and columns.
- Name the SEVEN parts that are found on this type of foundation. (7)

**[15]**

**QUESTION 3**

- 3.1 What must the concrete coverage for steel reinforcement be for the following:
- 3.1.1 Reinforced concrete beam
  - 3.1.2 Reinforced concrete slabs
  - 3.1.3 Reinforced concrete foundation
  - 3.1.4 Reinforced concrete columns
- (4 × 1) (4)
- 3.2 Name FIVE types of cement. (5)
- 3.3 Explain what is meant by efflorescence in brickwork. (3)
- 3.4 Calculate how much water you would need (litres) in the following situation:  
250 kg of cement with a water cement ratio of 0,4 (3)
- [15]**

**QUESTION 4**

- 4.1 Write the following abbreviations in full:
- 4.1.1 SC
  - 4.1.2 SP
  - 4.1.3 SW
  - 4.1.4 CE
  - 4.1.5 AO
  - 4.1.6 FH
- (6 × 1) (6)
- 4.2 State FOUR advantages of the pressure-valve geyser. (4)
- [10]**

**QUESTION 5**

- 5.1 Where would the following floor coverings be used?
- 5.1.1 Granolithic floors (1)
- 5.1.2 PVC tiles (2)
- 5.1.3 Thermoplastic tiles (1)
- 5.2 Explain the following painting terms briefly:
- 5.2.1 Prime coat
- 5.2.2 The undercoat
- 5.2.3 The finishing coat
- (3 × 2) (6)
- [10]**

**QUESTION 6**

- 6.1 A one-brick wall 35 m long and 4 m high has to be built. The wall has an opening of 3,5 m wide and 3 m high. Labour costs R300/m<sup>2</sup>.

**NOTE:** Half-brick walling (50 bricks/m<sup>2</sup>)  
1 m<sup>3</sup> of sand = 1 000 kg (tonne)

Calculate the following:

- 6.1.1 The area of the wall (6)
- 6.1.2 The amount of bricks required (2)
- 6.1.3 The amount of sand required (2)
- 6.1.4 The labour costs (2)
- 6.2 A variety of jointing can be applied to brickwork to give it a certain surface finish.
- Name FIVE different types of jointing. (5)

**[17]**

**QUESTION 7**

- 7.1 Calculate the volume of concrete that you would require in m<sup>3</sup> to cast a foundation 13 m long by 0,610 m wide and 0,305 m thick. (2)
  
  - 7.2 Explain the following parts of the road's structure:
    - 7.2.1 Soil survey
    - 7.2.2 Sub-grade
    - 7.2.3 Formation
    - 7.2.4 Base course
- (4 × 2) (8)  
**[10]**

**QUESTION 8**

- 8.1 Health and safety committees are essential.  
What are the THREE functions of such a committee? (3)
  
  - 8.2 According to the Occupational Health and Safety Act, there are general duties of employers to their employees.  
State FIVE of those duties. (5 × 2) (10)  
**[13]**
- TOTAL: 100**