



**higher education
& training**

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

**MATERIALS
NQF LEVEL 2**

(12010062)

**11 December 2020 (X-paper)
09:00–12:00**

This question paper consists of 6 pages.

569Q1N2011

<p>TIME: 3 HOURS MARKS: 100</p>

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. Start each section on a new page.
 5. Use only a black or blue pen.
 6. Write neatly and legibly.
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QUESTION 1

- 1.1 Give ONE term for each of the following descriptions by writing it next to the question number (1.1.1–1.1.5) in the ANSWER BOOK.
- 1.1.1 The ability of a material to absorb or handle impact forces.
- 1.1.2 A measure of how much heat is required to increase the temperature of an object. 
- 1.1.3 A measure of how much an object expands or contracts in its length when it is subjected to hot and cold temperature.
- 1.1.4 How well a material can stretch and then return to its original shape once stretching has stopped.
- 1.1.5 A measure of how long a material can last. (5 × 1) (5)
- 1.2 Name THREE habits that can help to combat the problems of pollution and protect our environment. (3)
- 1.3 Write the following abbreviations in full:
- 1.3.1 SABS 
- 1.3.2 SANS (2 × 1) (2)
- [10]**

QUESTION 2

- 2.1 Name and describe THREE primary layers of the earth. (6)
- 2.2 Define *plate tectonics*.  (2)
- 2.3 Name TWO types of rock that make up the earth's crust. (2)
- [10]**

QUESTION 3

- 3.1 Classify the following grain sizes as clay, sand or gravel:
- 3.1.1 All particles smaller than 0,002 mm. 
- 3.1.2 All particles between 0,075 mm and 2,5 mm.
- 3.1.3 All particles bigger than 2,5 mm but smaller than 200 mm. (3 × 1) (3)

3.2 State THREE effects of compaction on the mechanical and physical properties of soil. (3)

3.3 Define *adobe*.  (2)

3.4 What is the purpose of a foundation? (2)

[10]

QUESTION 4

4.1 List THREE types of kilns used to fire or sinter clay bricks. (3)

4.2 Complete the following table:

CODE	BRICK TYPE	DESCRIPTION
4.2.1 ...	Non-facing plastered.	Clay bricks suitable for general building work that are to be plastered.
NFX	4.2.2 ...	Clay bricks suitable for work below the DPC.
FBS	Face brick standard.	4.2.3 ...
4.2.4 ...	4.2.5 ...	Clay bricks that give the impression of a lively, multi-coloured rough surface.

(5 × 1) (5)

4.3 Name FIVE types of brick bonding methods.  (5)

4.4 Why must concrete be allowed to mature before it is used? (2)

[15]

QUESTION 5

- 5.1 Choose a description from COLUMN B that matches an item in COLUMN A. Write only the letter (A–E) next to the question number (5.1.1–5.1.5) in the ANSWER BOOK.

COLUMN A		COLUMN B	
5.1.1	Slump test	A	chemical reaction that starts when cement is exposed to water 
5.1.2	Concrete cube test	B	process of adding water to plastic concrete to restore workability
5.1.3	Tempering	C	process of allowing water to stand on a concrete surface
5.1.4	Ponding	D	test used to test if a concrete mix will reach the desired strength after it has cured
5.1.5	Hydration 	E	test used to determine the consistency of concrete

(5 × 1) (5)

- 5.2 List FIVE types of admixtures. (5)

- 5.3 Name TWO ways of measuring the correct amounts of ingredients to be used in the concrete mixing process. (2)



- 5.4 Give TWO advantages of mixing concrete on a hard, level surface. (2)

- 5.5 Give THREE reasons why over-compaction of concrete must be avoided. (3)

- 5.6 Why is it important that the concrete mixer must be set up close to the construction area? (2)

- 5.7 To achieve the required strength, concrete must be mixed correctly using the right ingredients.

Explain the negative side effects of the following materials on concrete:

5.7.1 Sugar

5.7.2 Fertilisers



(2 × 2) (4)

- 5.8 Name TWO things to check when receiving sand for concrete on site. (2)

[25]

QUESTION 6

- 6.1 Describe the type of sand to be used to produce workable mortar. (3)
- 6.2 Name FOUR useful functions of lime in mortar.  (4)
- 6.3 Name TWO disadvantages of having too much clay in sand for mortar. (2)
- 6.4 State ONE function of mortar. (1)
- [10]**

QUESTION 7

- 7.1 Describe how the glass-of-water test is used to indicate the type of substrate fit for plastering. (2)
- 7.2 State THREE important considerations when preparing a substrate. (3)
- 7.3 Name TWO advantages of masonry cement plaster. (2)
- 7.4 What is the main disadvantage of adding too much water to plaster? (2)
- 7.5 Why must plaster be mixed in small batches? (1)
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[10]

QUESTION 8

- 8.1 Indicate whether the following statements are TRUE or FALSE by writing only 'True' or 'False' next to the question number (8.1.1–8.1.5) in the ANSWER BOOK.
- 8.1.1 Toppings are sand-cement mixes that are not considered contributing to the strength of the underlying slab.
- 8.1.2 Monolithic screed or topping is cast as a separate layer on top of the slab.
- 8.1.3 A nominal stone size of 13 mm must be used for a 30 mm thick bonded topping.
- 8.1.4 A rubber-tyre roller is a machine used to chip a concrete surface.
- 8.1.5 Covering the surface with dry sand is a method to cure screeds. (5 × 1) (5)
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- 8.2 Differentiate between *bonded* and *unbonded screeds* and *toppings*. (4)
- 8.3 Name ONE function of screeds and toppings. (1)
- [10]**

TOTAL: 100