



**higher education
& training**

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

**MATERIALS
NQF LEVEL 2**

NOVEMBER 2011

(12010062)

**11 November (X-Paper)
09:00 – 12:00**

This question paper consists of 5 pages.

<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. Rule off across the page on completion of each question.
 5. ALL work you do not want to be marked must be clearly crossed out.
 6. Write neatly and legibly.
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QUESTION 1

- 1.1 Explain the following terms that are used in materials.
- | | | |
|-------|------------------|-----|
| 1.1.1 | Density | (1) |
| 1.1.2 | Relative density | (1) |
| 1.1.3 | Volume | (1) |
| 1.1.4 | Mass | (1) |
- 1.2 Compare the following terms using your own words:
- | | | |
|-------|--------|-----|
| 1.2.1 | Stress | (1) |
| 1.2.2 | Strain | (1) |
- 1.3 State TWO advantages of using materials that meet SABS/SANS standards.
(2 x 2) (4)
- [10]**

QUESTION 2

- 2.1 Complete the following sentences by using the words given in the list below. Write only the word(s) next to the question number (2.1.1 – 2.1.5) in the ANSWER BOOK. Each word can only be used ONCE.

trilliard; gaseous; star; eight; orbiting

- The earth of 2.1.1 ... planets that revolve around a 2.1.2 ... called the sun, in the milky way 2.1.3 The sun is only one of an estimated 2.1.4 ... stars found in other galaxies throughout the inverse. Large gaseous planets have also been found 2.1.5 ... close to the sun. (5 x 1) (5)
- 2.2 The structure of the earth has three primary layers.
- | | | |
|-------|---|-----|
| 2.2.1 | Name ONE of the layers. | (1) |
| 2.2.2 | Explain the layer that you mentioned in QUESTION 2.2.1. | (1) |
- 2.3 Name THREE common minerals that are found in South Africa. (3 x 1) (3)
- [10]**

QUESTION 3

- 3.1 Name the THREE elements that the constitution of soil is made up of. (3 x 1) (3)
- 3.2 Name TWO types of foundation. (2 x 1) (2)
- 3.3 Name THREE types of compaction equipment. (3 x 1) (3)
- 3.4 State TWO advantages of using rammed earth. (2 x 1) (2)
- [10]**

QUESTION 4

- | | | | |
|-----|--|---------|-------------|
| 4.1 | Describe how clay bricks are manufactured. | (3 x 1) | (3) |
| 4.2 | Briefly explain what is meant by <i>porosity</i> . | (2 x 1) | (2) |
| 4.3 | Explain vanadium staining of clay brickwork and state appropriate remedies to combat each problem. | (3 x 1) | (3) |
| 4.4 | Name TWO different types of face bricks and identify TWO other bricks normally used in construction. | (2 x 2) | (4) |
| 4.5 | Demonstrate proper cleaning of mortar smear and droppings on face brickwork. | (3 x 1) | (3) |
| | | | [15] |

QUESTION 5

- | | | | |
|-----|--|---------|-------------|
| 5.1 | Distinguish between the following terms: | | |
| | 5.1.1 Concrete | | (1) |
| | 5.1.2 Tendons | | (1) |
| | 5.1.3 Prestressed concrete | | (1) |
| | 5.1.4 In-Situ concrete | | (1) |
| | 5.1.5 Precast concrete | | (1) |
| 5.2 | What is understood by the term portland cement? | | (2) |
| 5.3 | List FIVE common admixtures. | (5 x 1) | (5) |
| 5.4 | Name the steps that must be followed when conducting a slump test. | (5 x 1) | (5) |
| 5.5 | Briefly describe the process of manufacturing Portland cement and indicate the TWO principal raw materials used. | (5 x 1) | (5) |
| 5.6 | Explain the correct procedure to be followed when storing cement. | (3 x 1) | (3) |
| | | | [25] |

QUESTION 6

- | | | | |
|-----|---|---------|-----|
| 6.1 | Define the term <i>mortar</i> . | | (2) |
| 6.2 | Identify THREE functions of mortar | (3 x 1) | (3) |
| 6.3 | List any FOUR main elements suitable to make mortar. | (4 x 1) | (4) |
| 6.4 | State TWO functions of plaster with reference to aesthetics and weather-proofing. | (2 x 1) | (2) |

- 6.5 Describe suitable mixes of plaster applied internally, externally and in a damp environment according to prescribed national standards. (2 x 1) (2)
- 6.6 Differentiate between plaster mixes made with masonry cement and plaster mixes made with common cement (2 x 1) (2)
- 6.7 Give TWO reasons for mixing and consuming only small batches of plaster. (2 x 1) (2)
- 6.8 Briefly explain what happens when hydrated builders lime is added to a mortar mix. (3 x 1) (3)
- [20]**

QUESTION 7

Indicate whether the following statements are TRUE or FALSE. Choose the answer and write only 'true' or 'false' next to the question number (7.1 – 7.10) in the ANSWER BOOK.

- 7.1 Screeds are a mixture of cement and sand applied in a smooth layer of substrate. (1)
- 7.2 There is no difference between screed and topping. (1)
- 7.3 Bonded screeds are applied to hard concrete. (1)
- 7.4 Slabs used in areas where there are high volumes of pedestrian traffic. (1)
- 7.5 To make screed you must use a common cement type such as CCM2 or CMN which must comply with SANS 50197 – 1. (1)
- 7.6 It is preferable to use plaster sand to make screed. (1)
- 7.7 When mixing by machine, the concrete should be mixed for at least 7 minutes. (1)
- 7.8 Hand mixing must be done on any surface. (1)
- 7.9 For bonded topping in excess of 40 mm thick use a nominal size of one quarter of the thickness. (1)
- 7.10 Use a maximum nominal stone size of 19 mm in any topping. (1)
- [10]**

TOTAL: 100