higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

MATERIALS
NQF LEVEL 2

(12010062)

2 March 2020 (Y-paper)
13:00–16:00

This question paper consists of 6 pages.

173Q1S2002

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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 blue or black pen.
5. Write neatly and legibly.

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QUESTION 1

1.1 Choose a description from COLUMN B that matches an item in COLUMN A. Write only the letter (A–E) next to the question number (1.1.1–1.1.5) in the ANSWER BOOK.

COLUMN A		COLUMN B	
1.1.1	Porosity	A	how a material reacts to being stretched so much that it can no longer return to its original shape
1.1.2	Toughness		
1.1.3	Malleability	B	a measure of how long a material can last
1.1.4	Durability	C	property of a material to be shaped or rolled into flat sheets without cracking or breaking
1.1.5	Plastic behaviour	D	the ability of a material to absorb fluids
		E	a measure of how well a material can resists complete failure such as cracking or breaking when a force is applied to it

(5 × 1) (5)

1.2 Name THREE things to be considered when selecting the right material for a particular application. (3)

1.3 State ONE benefit of using materials that meet the SABS/SANS standards. (1)

1.4 What is meant by recycling materials? (1)

[10]

QUESTION 2

2.1 Explain the formation of the following types of rocks:

2.1.1 Igneous rocks

2.1.2 Sedimentary rocks

2.1.3 Metamorphic rocks

(3 × 2) (6)

2.2 Soil formation is a continuing process that is caused by a number of factors.

Name THREE factors that determine the formation of soil. (3)

2.3 Which layer of the earth is found between the inner core and the outer shell? (1)

[10]

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QUESTION 3

3.1 State THREE problematic founding materials in South Africa. (3)

3.2 Name THREE types of foundation. (3)

3.3 Explain what is meant by the following ways of compacting soil:

3.3.1 Static compaction (kneading and pressure) compaction

3.3.2 Dynamic compaction (vibrating and impact)

(2 × 2) (4)
[10]

QUESTION 4

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

4.2 Differentiate between over-burnt bricks and under-burnt bricks. (2 × 2) (4)

4.3 State TWO advantages of glazed bricks. (2)

4.4 What do the following abbreviations mean?

4.4.1 FBX

4.4.2 NFP

(2 × 1) (2)

4.5 Name THREE main types of concrete masonry units. (3)

4.6 What is the advantage of using shell-bedded walls? (1)
[15]

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QUESTION 5

5.1 State FOUR benefits of compacting concrete. (4)

5.2 Name TWO materials that were used by the Romans to construct many of their buildings before the discovery of cement. (2)

5.3 Briefly explain why tensile forces should be avoided in concrete? (3)

5.4 Name the material that is embedded in the concrete to make concrete more resistant to bending and crushing. (1)

5.5 Name the type of PPE that a person should use when touching cement to prevent damage to the hands. (1)

5.6 What is Portland cement? (2)

5.7 Briefly explain why the following materials should be avoided in a concrete mix:

5.7.1 Seawater

5.7.2 Clay

(2 × 2) (4)

5.8 State FOUR advantages of ready-mixed concrete. (4)

5.9 State the purpose of a slump test. (2)

5.10 SANS 10100-2 states that concrete must be placed within 1 hour after mixing.

Explain why there must be no delay in the placing of concrete. (2)

[25]

QUESTION 6

6.1 Name FOUR suitable elements that are used to produce workable mortar for masonry. (4)

6.2 Name THREE disadvantages of using common cement to make mortar. (3)

6.3 State THREE functions of mortar. (3)

[10]

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QUESTION 7

7.1 Give TWO main reasons why walls and the surfaces of the structure need to be plastered. (2)

7.2 What are the benefits of adding lime to plaster? (2)

7.3 Why should the surface of the substrate be dry before it can be plastered? (1)

7.4 Give TWO reasons for mixing and using smaller batches of plaster. (2)

7.5 Name THREE alternative methods of bonding plaster to the substrate. (3)
[10]

QUESTION 8

8.1 Define the following terms:

8.1.1 Toppings

8.1.2 Screeds

(2 × 2) (4)

8.2 State THREE advantages of using scabbler to prepare a smooth concrete surface. (3)

8.3 State THREE types of screeds and toppings. (3)
[10]

TOTAL: 100

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