higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

MATERIALS
NQF LEVEL 2

(12010062)

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13:00–16:00

This question paper consists of 7 pages.

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DEPARTMENT OF HIGHER EDUCATION AND TRAINING
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)
MATERIALS
NQF LEVEL 2
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. Start each section on a NEW page.
5. Use only BLUE or BLACK ink.
6. Write neatly and legibly.

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QUESTION 1

1.1 Explain what is meant by the following terms used to define material properties:

1.1.1 Toughness

1.1.2 Bulk density

(2 × 2) (4)

1.2 Draw a graph that represents the relationship between stress and strain for steel. (5)

1.3 Name ONE factor one would consider when designing a building that uses very little energy and effectively contributes positively to the environment. (1)

[10]

QUESTION 2

2.1 Define the *formation of the earth according to the Big Bang Theory*. (3)

2.2 2.2.1 Name the part of the earth between the core and the crust.

2.2.2 Which type of rock is formed when magma from below the earth's surface cools and solidifies?

2.2.3 South Africa is a world-leading producer of precious metals.

Name a useful mineral deposit which is found in Witwatersrand quartzite. (3)

2.3 What is *metamorphism*? (1)

2.4 List THREE types of rocks. (3)

[10]

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QUESTION 3

3.1 Give TWO reasons why silt is not commonly used as a construction material. (2)

3.2 Name TWO problems that may occurs in an around buildings if soil is not properly compacted. (2)

3.3 Name the following compaction equipment:

3.3.1



3.3.2



(2 × 1) (2)

3.4 Describe the following types of traditional building techniques.

3.4.1 Wattle and daub

3.4.2 Rammed earth

(2 × 2) (4)

[10]

QUESTION 4

4.1 Name TWO raw materials that are used to make clay bricks. (2)

4.2 List THREE disadvantages of a primitive clamp/field kiln. (3)

4.3 Face brick can be left exposed without any plastering applied to it.

Give TWO good properties of face bricks to support this statement. (2)

4.4 Why it is not recommended to carry out wall construction in rainy weather? (3)

4.5 State TWO advantages of adding crushed burnt clay in the manufacturing of concrete bricks. (2)

4.6 Name the organisation that conducts quality control to ensure that materials used in the concrete manufacturing process are of high standards. (1)

4.7 Give TWO requirements for the maturation of concrete. (2)

[15]

QUESTION 5

5.1 Explain the following concrete terminology:

5.1.1 Curing

5.1.2 Bleeding

(2 × 2) (4)

5.2 State the benefit of compacting concrete while it is in its green state. (2)

5.3 Differentiate between *tensile* and *compressive* strength of concrete. (4)

5.4 Give THREE kinds of PPE required when working with cement and concrete. (3)

5.5 State TWO advantages of adding slag to the manufacturing of units. (2)

5.6 What is the general rule about the type of water best suited for concrete mixtures according to SANS 2001-CC1 and CC2? (3)

5.7 List THREE correct procedures for storing cement. (3)

5.8 Differentiate between *plastic settlement cracks* and *plastic shrinkage cracks*. (4)

[25]

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QUESTION 6

6.1 Describe the type of sand to be used to ensure that mortar mixes are of the right quality and consistency. (3)

6.2 Give TWO reasons why masonry cement is the preferred type of cement for making mortar. (2)

6.3 Indicate whether the following statements are TRUE or FALSE. Choose the answer and only 'True' or 'False' next to the question number (6.3.1–6.3.5) in the ANSWER BOOK.

6.3.1 Lime prevents the mortar mix from drying out too quickly.

6.3.2 Mortar cannot be used to fill open spaces in a wall.

6.3.3 Re-tempering is the process of adding cement to make mortar more durable.

6.3.4 Raking done on a wall that has been standing for many years is called compaction.

6.3.5 Presoaking clay brick helps to reduce the possibility of the clay brick absorbing the moisture from the mortar.

(5 × 1) (5)

[10]

QUESTION 7

7.1 Define *aesthetics of plaster*. (2)

7.2 Name THREE methods that one can use to clean the substrate to be plastered. (3)

7.3 List THREE advantages of using masonry cement when plastering a wall. (3)

7.4 Name TWO common problems that may be encountered in plastering work. (2)

[10]

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QUESTION 8

8.1 Choose an item from COLUMN B that matches a description in COLUMN A. Write only the letter (A–E) next to the question number (8.1.1–8.1.5) in the ANSWER BOOK.

COLUMN A		COLUMN B	
8.1.1	Layer of sand-cement laid to finish a floor surface	A	toppings
8.1.2	Applied when the underlying concrete has not yet set	B	screed
8.1.3	A layer placed on top of the concrete base to increase structural strength and depth of the base	C	monolithic screeds
8.1.4	A test apparatus used for testing screed	D	scrabblier
8.1.5	A machine used to chip a concrete surface	E	BRE screed tester

(5 × 1) (5)

8.2 Name THREE methods commonly used to cure screeds and toppings. (3)

8.3 Name TWO suitable materials for casting screeds and toppings. (2)

[10]

TOTAL: 100

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