higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

MATERIALS
NQF LEVEL 2

(12010062)

1 March 2019 (X-Paper)
09:00–12:00

Candidates may use drawing instruments.

This question paper consists of 6 pages.

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. The sketches and/or diagrams must be done neatly in PENCIL, reasonably large, in proportion and fully labelled.
5. ALL the abbreviations and symbols must comply with the latest National Building Regulations and relevant SANS (SABS) codes.
6. Write neatly and legibly.

QUESTION 1

1.1 Explain each of the following terms:

1.1.1 Flammability

1.1.2 Relative density

1.1.3 Electrical conductivity

(3 × 2) (6)

1.2 State THREE reasons why the building industry uses SANS/SABS certified materials (3)

1.3 Define *recycling*. (1)

[10]

QUESTION 2

2.1 Define *geological time.* (2)

2.2 Draw a diagram to show the structure of the earth. (4)

2.3 Explain how metamorphic rock is formed. (4)

[10]

QUESTION 3

3.1 Define *soil compaction.* (2)

3.2 Give TWO effects on the mechanical and physical properties of soil when it is compacted. (2)

3.3 Name the compaction equipment used to push stone chips into the tar when new roads are constructed. (1)

3.4 Give TWO reasons why Adobe is an important a building material. (2)

3.5 Name TWO problematic founding materials commonly found in South Africa. (2)

3.6 Give ONE solution for laying foundations on soft clays. (1)

[10]

QUESTION 4

4.1 Explain how clay brick should be treated before use to reduce the brick's porosity and permeability. (3)

4.2 Give THREE ways to combat moisture induced expansion. (3)

4.3 Explain vanadium staining of clay brickwork. (2)

4.4 How can you safely clean the mortar stains off face brickwork by hand? (3)

4.5 Define each of the following terms:

4.5.1 Bunker ash

4.5.2 Crushed burnt clay

(2 × 2) (4)

[15]

QUESTION 5

5.1 Indicate whether the following statements are TRUE or FALSE. Choose the answer and write only 'True' or 'False' next to the question number (5.1.1–5.1.5) in the ANSWER BOOK.

5.1.1 In-situ concrete is concrete that is cast or placed where it is to be used.

5.1.2 Extender is a cement-like material that acts as a binder when used with common cement.

5.1.3 Entrapped air is air that was trapped by the concrete when it was placed.

5.1.4 Accelerators are admixtures that slow down the hydration of cement.

5.1.5 Fly ash is a cement extender made from the ash of burnt coal.

(5 × 1) (5)

5.2 Name THREE factors that determine the hardening and strength gain of concrete. (3)

5.3 Explain why strong stones must be added during the compaction of concrete. (2)

5.4 Name TWO basic raw materials used in the manufacturing of Portland cement. (2)

5.5 State THREE advantages of using extenders. (3)

5.6 Give THREE benefits of specifying and buying materials that conform to the prescriptions of the national standards. (3)

5.7 Describe the negative side effects of the following unsuitable materials in a concrete mix:

5.7.1 Fertilisers

5.7.2 Sand with high fines or clay content

(2 × 2) (4)

5.8 Explain the effects of calcium chloride in reinforced concrete. (2)

5.9 State the slump ranges best suited for hand placement of concrete. (1)
[25]

QUESTION 6

6.1 How can you identify mortar which is ready to be applied to a building? (2)

6.2 Give THREE functions of hydrated builder's lime in mortar. (3)

6.3 Explain each of the following terms:

6.3.1 Presoaking burnt clay masonry units

6.3.2 Dry laid concrete blocks

(2 × 2) (4)

6.4 What type of sand is best suitable for mortar? (1)
[10]

QUESTION 7

7.1 Explain TWO functions of plaster with reference to waterproofing. (2)

7.2 State FOUR alternative methods of bonding plaster to a concrete soffit. (4)

7.3 Explain the difference between plaster mixes made with masonry cement and plaster mixes made with common cement. (4)
[10]

QUESTION 8

8.1 Define the term *screeds.* (2)

8.2 State the nominal volume mix proportions for a domestic screed. (1)

8.3 How can the unbounded screed or topping be prevented from adhering to the concrete substrate? (2)

8.4 Describe a method to ensure that screeds and toppings are applied to the correct levels and flatness. (3)

8.5 How can you determine whether or not a screed layer has dried well enough for a surface finish such as tiling or carpet to be applied? (2)

[10]

TOTAL: 100