



**higher education
& training**

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

**MATERIALS
NQF LEVEL 2**

(12010062)

**16 November 2023 (Y-paper)
13:00–16:00**

This question paper consists of 6 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 a black or a blue pen.
 6. Write neatly and legibly.
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QUESTION 1

Explain the following terms used to define the properties of materials:

- 1.1 Thermal resistance 
- 1.2 Heterogeneous behaviour
- 1.3 Impact resistance
- 1.4 Porosity
- 1.5 Malleability

(5 × 2) [10]

QUESTION 2

- 2.1 Indicate whether the following statements are TRUE or FALSE by writing only 'True' or 'False' next to the question number (2.1.1–2.1.3) in the ANSWER BOOK. 

2.1.1 The Big Bang Theory suggests that all matter was once only a tiny particle, and that at one point in time it exploded with an immense force and release more particles.

2.1.2 Inner core is the molten rock found beneath the surface of the earth.

2.1.3 The theory that suggests that the earth's lithosphere is made up of twelve plates that are joined together is called plate tectonics 

(3 × 1) (3)

2.2 Name and describe TWO layers of the earth. (4)

2.3 What is geological process of soil formation? (3)

[10]

QUESTION 3

3.1 Name FOUR types of soil. (4)

3.2 Name FOUR materials that are used in traditional building techniques. (4)

3.3 List TWO problematic founding materials commonly found in South Africa. (2)

[10] 

QUESTION 4

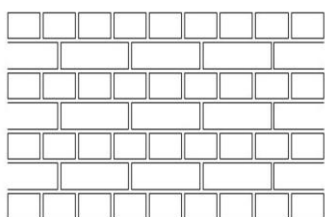
4.1 Name THREE ways to prevent moisture-induced expansion. (3)

4.2 Name THREE different brick manufacturing processes.  (3)

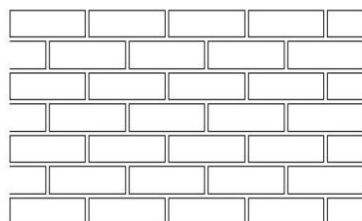
4.3 Explain the term, *brickwork deterioration*. (3)

4.4 Many different types of bonding techniques exist. Name the bonding techniques used in construction industry shown below.

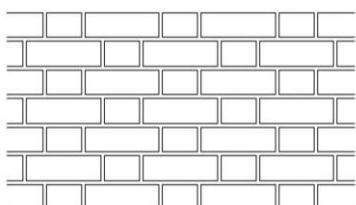
4.4.1



4.4.2



4.4.3



(3 × 1) (3)

4.5 Give TWO methods that can be used to remove vanadium stains. (2)

4.6 What is a cavity wall?  (1)
[15]

QUESTION 5

- 5.1 Choose a term from COLUMN B that matches a description in COLUMN A. Write only the letter (A–L) next to the question number (5.1.1–5.1.10) in the ANSWER BOOK.

COLUMN A		COLUMN B
5.1.1	The lower part of a foundation of a column, wall, building	A paste 
5.1.2	The process where mortar is used to cover surfaces like walls, floors and ceilings	B bleeding
5.1.3	Any material that is added to cement to make more cement mix	C cement
5.1.4	Chemicals that are mixed into the concrete mix to improve the strength 	D binder
5.1.5	A mixture of only cement and water	E beams
5.1.6	The process that prevents setting concrete from being damaged or cracked	F concrete
5.1.7	A structural element that primarily resists laterally applied loads	G additives
5.1.8	Added to cement during manufacturing to improve its properties	H curing
5.1.9	The process where water starts appearing on the concrete's surface, once the concrete has started to set	I admixtures
5.1.10	A material used to form materials into a cohesive whole, as a means of providing structural stability	J plastering
		K extenders
		L footing 

(10 × 1) (10)

- 5.2 Explain briefly why concrete is chosen as a common building material. (2)
- 5.3 Explain the tensile and compressive strength of concrete. (2 × 2) (4)
- 5.4 Name THREE different types of compacting techniques. (3)
- 5.5 Name FOUR ways of storing admixtures that are used in the making of concrete.  (4)
- 5.6 Why are steel bars inserted/encased in concrete in most cases? (2)

[25]

QUESTION 6

- 6.1 Name THREE basic ingredients of mortar. (3)
- 6.2 Discuss the process of mixing mortar. (5)
- 6.3 Name TWO primary functions of mortar. (2)
- [10]**

QUESTION 7

- 7.1 Define the term, *curing compounds*. (2)
- 7.2 Name TWO advantages for mixing and consuming only small batches of plaster. (2)
- 7.3 Explain the formation of plastic shrinkage cracks in plaster and recommend precautions to combat these cracks. (3)
- 7.4 List THREE methods of bonding plaster to a concrete soffit. (3)
- [10]**

QUESTION 8

- 8.1 Complete the following statements by filling in the missing words. Write only the answer next to the question number (8.1.1–8.1.6) in the ANSWER BOOK.
- 8.1.1 A 50 mm thick layer laid on top of an existing base is called ...
- 8.1.2 A screed board is a tool that is used to ... and smooth concrete.
- 8.1.3 Bond failure is when the screed or topping does not ... to the base layer.
- 8.1.4 A device that removes concrete by pecking at it at high speed is called ...
- 8.1.5 A ... is a test apparatus for testing screed.
- 8.1.6 ... is a plastic material that is used in construction to prevent water penetration.
- (6 × 1) (6)
- 8.2 Describe screeds and toppings and the function of each. (2 × 2) (4)
- [10]**

TOTAL: 100