higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

MATERIALS
NQF LEVEL 2

(12010062)

7 November 2022 (Y-paper)
13:00–16:00

This question paper consists of 7 pages.

103Q1N2207

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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

Various options are given as possible answers to the following questions. Choose the answer and write only the letter (A–C) next to the question number (1.1–1.10) in the ANSWER BOOK.

1.1 The density of a material is the mass of the given material contained within a given …

A mass.
B density.
C volume.

1.2 70-MPA grade bricks are …

A made for damp conditions.
B designed for specific structural purposes.
C irregular in shape due to their method of manufacturing.

1.3 The durability of a material refers to …

A how cheap the material is.
B how long the material will stretch.
C how long the material will last.

1.4 The correct stone size for a topping that is 30 mm thick is …

A 0,5 mm.
B 0,95 mm.
C 90,5 mm.

1.5 When a building is demolished, a lot of building materials can be recycled.

Which ONE of the following building materials cannot be recycled?

A Window frames
B Corrugated iron sheets
C Damp-proof course

1.6 Igneous rock is formed by …

A volcanic eruptions.
B metamorphism.
C sand.

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1.7 A material is considered to be transparent if …

A it can bend.
B light can move through it.
C light cannot move through it.

1.8 The ... ensures the safety of people at work.

A South African Bureau of Standards
B Occupational Health and Safety Act
C South African National Standards

1.9 The flammability of a material tells you …

A how easily the material will catch a fire.
B how far the material can be deformed.
C how easily gases or liquid can penetrate the material.

1.10 The … is acceptable within the slump tolerance range.

A collapsed slump
B shear slump
C true slump

(10 × 1) **[10]**

QUESTION 2

Indicate whether the following statements are TRUE or FALSE by writing only 'True' or 'False' next to the question number (2.1–2.10) in the ANSWER BOOK.

2.1 Coal is formed from a very large amount of dead land-based plant life, mainly trees that died between 360 mya and 65 mya.

2.2 Stress is the ratio of a force to the area of an object over which the force is applied.

2.3 Aesthetics is one of the functions of plaster and refers to the beauty of a structure.

2.4 Igneous rocks are formed when magma cools down and solidifies, either on the earth's surface or inside the earth.

2.5 Adobe refers to a specific type of building material that is usually made up of a mixture of clay, sand, water and, at times, straw and sticks.

2.6 Common cement plaster retains water well and is less absorbent than masonry cement plaster.

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2.7 Protolithic is the original rock from which volcanic rock formed.

2.8 Plate tectonics is a theory that suggests that the earth's lithosphere is made up of about seven plates that are joined together.

2.9 An aeon is the largest subdivision of geological time.

2.10 A fissure is a long crack through which magma erupts at the earth's surface.

(10 × 1) **[10]**

QUESTION 3

Choose an item from COLUMN B that matches a description in COLUMN A. Write only the letter (A–K) next to the question number (3.1–3.10) in the ANSWER BOOK.

COLUMN A		COLUMN B	
3.1	The result of a force over an area	A	mineral
3.2	A cloud of gas and dust in space	B	concrete
3.3	A process that forces soil particles closer together	C	hand vibrator
3.4	A type of compaction equipment	D	core
3.5	A yellow-green discolouration on a brick surface	E	stress
3.6	A continuous strip of mortar laid on the face shells	F	floating
3.7	A mixture of sand, cement, crushed stone and water	G	compacting
3.8	To make the surface smooth or level	H	galactic nebula
3.9	The innermost layer of the earth	I	shell bedding
3.10	Raw material that make up rocks	J	vanadium staining
		K	optimum

(10 × 1) **[10]**

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QUESTION 4

4.1	Describe how to identify efflorescence on the surface of a brick.	(2)
4.2	List FOUR errors that may cause brick deterioration.	(4)
4.3	Discuss the importance of brick bonding.	(3)
4.4	Moisture-induced expansion occurs when bricks absorb moisture over a long period. How would you combat moisture-induced expansion?	(4)
4.5	Explain the effect of vanadium staining on brickwork.	(2)

[15]

QUESTION 5

5.1	Briefly discuss the principles of good housekeeping when storing and using admixtures.	(5)
5.2	Name THREE dangers of working with cement and concrete.	(3)
5.3	Name TWO materials that are unsuitable for making concrete.	(2)
5.4	Explain how plastic shrinkage cracks in concrete can be prevented.	(4)
5.5	Define the term *curing of concrete*.	(2)
5.6	State THREE advantages of using ready-mixed concrete.	(3)
5.7	Name THREE equipment that are required to carry out a slump test according to SANS 5862-1:2006.	(3)
5.8	What type of water is best suited for concrete mixtures?	(3)

[25]

QUESTION 6

6.1	Sand is not a homogeneous material, so in order to obtain the specified sand sample, you must perform a distribution test. Name THREE types of sieving tools.	(3)
6.2	Explain the relationship between *mortar cube strength* and *brick strength*.	(4)
6.3	Name THREE factors you would consider to assess the suitability of sand.	(3)

[10]

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QUESTION 7

7.1	Give TWO reasons why plaster should be mixed and used in small batches.	(2)
7.2	What preparation work should be done on a substrate before plaster can be applied?	(3)
7.3	How can plastic shrinkage cracks in plaster be prevented?	(3)
7.4	What will happen if you apply plaster incorrectly and do not scratch it before you apply the next coat of plaster?	(2)
		[10]

QUESTION 8

8.1	Describe FOUR methods for curing screeds.	(4)
8.2	What is an important fact to consider when choosing screed or topping?	(2)
8.3	Specify the least amount of time that can be given to screed to dry before tiling it with floor tiles.	(2)
8.4	Name the tool that is used to remove an old layer of a hardened concrete floor.	(1)
8.5	Give the size of the stones needed to cast a topping of around 30 mm thick.	(1)
		[10]

TOTAL: 100

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