higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

MATERIALS
NQF LEVEL 4

(12010484)

7 November 2022 (X-paper)
09:00–12:00

This question paper consists of 6 pages.

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TIME: 3 HOURS
MARKS: 100

INSTRUCTIONS AND INFORMATION

1. Answer all the questions.
2. All questions MUST be answered.
3. Number the answers according to the numbering system used in this question paper.
4. Write neatly and legibly.

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QUESTION 1: PLASTICS

1.1 Various options are given as possible answers to the following questions. Choose the answer and write only the letter (A–D) next to the question number (1.1.1–1.1.5) in the ANSWER BOOK.

1.1.1 Refers to the ratio of stress to strain:

A High creep
B Low elastic modulus
C Low density
D Electrical insulation

1.1.2 The tendency of a solid material to slowly move or deform permanently under the influence of stress.

A Combustibility
B Electrical insulation
C High creep
D Low density

1.1.3 A solid thermoplastic polymer the structure of which is quite different from that of other plastics.

A Teflon
B Polyester
C Nylon
D Polycarbonate

1.1.4 The process by which a material is eroded and damaged because of a chemical reaction.

A Corrosion
B Plexiglass
C Polyvinyl chloride
D Polyethylene

1.1.5 A transparent thermoplastic mostly used to replace normal glass in applications where it would not be safe to use glass.

A Plexiglass
B Polyester
C Polyamides
D Polypropylene

(5 × 1) (5)

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1.2 Choose ONE term from the list below for each of the following descriptions and write the answer next to the question number (1.2.1–1.2.5) in the ANSWER BOOK.

polyvinyl chloride; nylon; teflon; polyester; polyethylene

1.2.1 A strong thermoplastic made of hydrogen and carbon atoms.

1.2.2 A type of thermoplastic material that is used to make toothbrush brittles, reflective safety belts, gloves; carpets, etc.

1.2.3 It constitutes hydrogen, carbon and chloride atoms.

1.2.4 Renowned for its high resistance to chemicals, corrosion, and friction.

1.2.5 Commonly utilised to manufacture clothes, bed sheets and curtains.

(5 × 1) (5)

1.3 Explain the following terms:

1.3.1 Lamination

1.3.2 Photo degradation

(2 × 2) (4)

1.4 List FOUR properties of plastic. (4)

1.5 State TWO advantages of using plastic. (2)

[20]

QUESTION 2: ELASTOMERS.

2.1 List THREE crucial desirable properties of elastomers. (3)

2.2 Silicone sealant is a versatile and flexible waterproof sealant that has many applications.

What are the FIVE key features of silicone? (5)

2.3 Explain the meaning of *permeability*. (2)

[10]

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QUESTION 3: ADHESIVES.

3.1 Differentiate between a *contact adhesive* and a *hot-melt adhesive*. (6)

3.2 State FIVE factors that determine the strength of glued bonds. (5)

3.3 Surfaces that are to be bonded must be properly prepared before the adhesive is applied.

Write down FOUR important considerations to be made prior to applying the bond. (4)
[15]

QUESTION 4: PAINTS, WATER REPELLENTS, COATINGS AND PRESERVATIONS.

4.1 Explain the meaning of the hazard classification symbol, *H2,* which appears on a piece of treated timber. (3)

4.2 Mention THREE applications of treated timber with a hazard classification of H2. (3)

4.3 List THREE basic components of paint. (3)

4.4 Both ferrous and non-ferrous metals are used in the construction industry.

Provide a FIVE-STEP guide of basic procedures to be followed when cleaning non-ferrous metals. (5)

4.5 There are many advantages of bagging. State SIX. (6)
[20]

QUESTION 5: WATERPROOFING OF BUILDINGS, DAMP PROOFING AND VAPOUR BARRIER INSTALLATION.

5.1 Write an instructional memo to a colleague explaining the step by step method to apply acrylic waterproofing paints using membrane or cloth. (5)

5.2 State THREE reasons why organosilane or siloxane is popular. (3)

5.3 Name TWO waterproofing products used for flat roofs in South Africa. (2)

5.4 Define the term, *cavity wall*. (2)

5.5 What purpose is served by damp-proof course (DPC) in the building industry? (3)
[15]

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QUESTION 6: BITUMEN, TAR AND ASPHALT.

6.1	List FOUR properties of bitumen as a construction material.	(4)
6.2	State TWO advantages of open graded asphalt.	(2)
6.3	Name TWO types of asphalt that are commonly used in South Africa.	(2)
6.4	Briefly explain *bitumen emulsion*.	(2)
		[10]

QUESTION 7: FASTENERS.

7.1	Name TWO types of rivets used in the construction industry.	(2)
7.2	State FIVE advantages of using threaded fasteners when securing structural components.	(5)
7.3	Write down THREE functions of a bolt list.	(3)
		[10]

TOTAL: 100

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