



higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

MATERIALS NQF LEVEL 4

(12010484)

**4 December 2020 (X-paper)
09:00–12:00**

This question paper consists of 6 pages.

305Q1N2004

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. All drawings must be neat and well balanced
 5. Start each section on a new page.
 6. Use only a black or blue pen.
 7. All work you do not wish to be marked, must be clearly crossed out.
 8. Write neatly and legibly.
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QUESTION 1

- 1.1 Complete the following paragraph or paragraphs by choosing a word or words from the list below. Write only the answer next to the question number (1.1.1–1.1.7) in the ANSWER BOOK.

rates; air; hydrocarbon compounds; toxic; combustion;
temperature; pollution

Plastics are (1.1.1) ... like fuel oil, kerosene, and natural gas. Hydrocarbon burn well and cleanly when combined with enough (1.1.2) ... As a general rule, the higher the (1.1.3)... of combustion, the lower the products of incomplete (1.1.4)... escaping in the form of air emission, or simply put air (1.1.5)... Different plastics show different combustibility (1.1.6)... Some plastics give off (1.1.7)... fumes when they burn.



- 1.2 State FOUR examples of the type of plastics used in the construction industry and one usage of each of them. (4 × 2) (7)
- 1.3 Name FIVE advantages of composite material in the construction industry. (5)
- [20]**

QUESTION 2

- 2.1 Rubber, an elastomer with various properties is used extensively in the construction industry.

State FOUR of usages of rubber in construction.



- 2.2 Explain why it is necessary to cut joints in a concrete slab after it has hardened. (4)
- 2.3 State ONE advantage and ONE disadvantage of silicone sealant. (2)

[10]

QUESTION 3

- 3.1 State THREE precautions to observe when applying contact adhesives to surfaces assuring the surface is properly glued. (3 × 2) (6)

- 3.2 Explain, in FIVE steps how to glue together two pieces of wood using PVA emulsion wood glue. (5)




- 3.3 Leaving epoxies exposed to sunlight negatively affects the epoxy.

List FOUR effects of over exposure to sunlight on epoxies.




(4)
[15]



QUESTION 4

- 4.1 Resin/ binders and solvents are constituents of paints.  List TWO functions of each of the constituents mentioned. (2 × 2) (4)
- 4.2 Explain in FIVE steps, how to clean the white like substance (efflorescence) on a plastered wall that has to be painted. (5)
- 4.3 State FIVE advantages of bagging. (5)
- 4.4 Name TWO functions served by each coat of the following three-coat paint system:
- 4.4.1 Primer coat 
- 4.4.2 Under-coat 
- 4.4.3 Top or finish coat
- (3 × 2) (6)
[20]

QUESTION 5

- 5.1 The properties of the individual ingredients of an acrylic resin-based cementitious system when combined, make the product stronger and more durable.
- State FIVE other advantages of an acrylic resin-based cementitious system. (5)
- 5.2 Make a neat, fully labelled cross-sectional sketch of the bottom section of a timber window sill built into a double-leaf 50mm cavity wall showing the following:
- A brick on edge external sill and an internal wooden sill
 - Damp-proofing in place
 - A tie wire in place
 - Inside and outside reveal: plastered inside and face outside
-  (10)
[15]

QUESTION 6

- 6.1 Assume you are a works foreman; outline a FOUR STEP induction session for new employees, working with bitumen, before they start working. (4)
- 6.2 Name FOUR properties of bitumen.  (4)
- 6.3 Tar poses an environmental hazard. 
- State TWO reasons why tar has been banned in South Africa. (2)
[10]

QUESTION 7

7.1 Indicate whether the following statements are TRUE or FALSE by writing only 'True' or 'False' next to the question number (7.1.1–7.1.4) in the ANSWER BOOK

7.1.1 Threaded fasteners are visible whereas welding is not visible.



7.1.2 Threaded fasteners improve stress distribution and welding does not improve stress distribution.

7.1.3 Threaded fasteners are cost effective whereas welding is not.

7.1.4 Materials of any size and shape can be joined for both welding and threaded fasteners.

(4 × 1) (4)

7.2 State FOUR precautions that should be taken to ensure that bolts are tightened correctly. (4)

7.3 Name TWO types of nuts to be used with dynamic loads (such as vibrations) exerted on a bolted connection to prevent the nut or bolt from working loose. (2)



[10]

TOTAL: 100