



**higher education
& training**

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

**MATERIALS
NQF LEVEL 4**

NOVEMBER 2011

(12010484)

**11 November (Y-Paper)
13:00 – 16:00**

This question paper consists of 5 pages.

<p>TIME: 3 HOURS MARKS: 100</p>

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 work you do not want to be marked must be clearly crossed out.
 5. ALL the abbreviations and symbols must comply with the latest National Building Regulations and all relevant SANS (SABS) codes.
 6. Rule off across the page on completion of each question.
 7. Write neatly and legibly.
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QUESTION 1: PLASTICS

- 1.1 Read the following passage and complete the following sentences by using the words provided in the list below. Write only the word(s) next to the question number (1.1.1 – 1.1.4) in the ANSWER BOOK.

old, newer, polypropylene, expensive, polyethylene, material

Polypropylene is one of the 1.1.1 types of thermoplastic 1.1.2 and also one of the most 1.1.3

It is a lot more flexible than 1.1.4 but not as flexible as plasticised PVC.

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|-----|--|---------|-------------|
| | | (4 × 1) | (4) |
| 1.2 | Distinguish between thermosetting plastic and thermoplastic. | (4 × 1) | (4) |
| 1.3 | Discuss the origins of plastic. | (3 × 1) | (3) |
| 1.4 | Describe the following main desirable properties of plastic: | | |
| | High thermal expansion. | | (1) |
| 1.5 | Name TWO types of composite materials and describe how they are used to reinforce plastic. | (4 × 1) | (4) |
| 1.6 | Discuss the advantages of composite materials in construction. | (4 × 1) | (4) |
| | | | [20] |

QUESTION 2: ELASTOMERS

- | | | | |
|-----|---|---------|-------------|
| | | (3 × 1) | (3) |
| 2.1 | Prepare a list of THREE materials that acetic acid-based silicone sealants will not adhere to. | | |
| 2.2 | Define the following concepts: | | |
| | 2.2.1 Gun grade | | (1) |
| | 2.2.2 Flow grade | | (1) |
| 2.3 | Briefly explain the preparation procedure before inserting a polyethylene foam bond breaker into a joint. | (3 × 1) | (3) |
| 2.4 | Identify a non-acetic acid-based silicone sealant that will adhere to masonry and concrete. | (2 × 1) | (2) |
| | | | [10] |

QUESTION 3: ADHESIVE

- 3.1 Explain the following terms:
- | | | | |
|-------|-----------------------|---------|-----|
| 3.1.1 | Organic adhesive | (1 × 1) | (1) |
| 3.1.2 | Synthetic adhesive | (1 × 1) | (1) |
| 3.1.3 | Rubber-based adhesive | (1 × 1) | (1) |
- 3.2 Prepare a list of THREE exponents in relation to bad bond strength of glue joints. (3 × 1) (3)
- 3.3 How will you prepare the surfaces to be joined and ensure that they are well fitted, dry, dust – free and sound? (3 × 1) (3)
- 3.4 Name and describe TWO types of sealants which are available for joint filling purposes. (4 × 1) (4)
- 3.5 Generate a list of precautionary measures that must be taken when working with epoxy adhesives. (2 × 1) (2)
- [15]**

QUESTION 4: PAINTS, WATERREPELLENTS, COATING AND PRESERVATIVES

- 4.1 Prepare a list of TWO of the constituents of paint, and describe the functions of each one. (2 × 2) (4)
- 4.2 Compare the advantages and disadvantages of using limewash for masonry coatings. (6 × 1) (6)
- 4.3 Briefly discuss how creosote acts as an effective wood preservative. (2 × 1) (2)
- 4.4 Briefly discuss the method of acid pickling to prepare the surface of steel for painting. (2 × 1) (2)
- 4.5 There are THREE types of paint that are no longer recommended for use.
- | | | | |
|-------|--|---------|-----|
| 4.5.1 | Produce the list of the THREE types of paint. | (3 × 1) | (3) |
| 4.5.2 | Categorise an example list of each paint type. | (3 × 1) | (3) |
- [20]**

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

- | | | | |
|-----|---|---------|-------------|
| 5.1 | Briefly describe how you would apply bitumen membranes or torch-on to the surface of a flat roof. | (4 × 1) | (4) |
| 5.2 | Explain the role of a Damp Proof Course (DPC) in the building environment. | (3 × 1) | (3) |
| 5.3 | Explain why you would apply another cover on top of roof waterproofing. | (4 × 1) | (4) |
| 5.4 | State the minimum falls on a flat roof according to prescribed national standards. | (2 × 2) | (4) |
| | | | [15] |

QUESTION 6: BITUMEN, TAR AND ASPHALT

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|-----|--|---------|-------------|
| 6.1 | How would you apply the health and safety risk processes when working with asphalt? | (3 × 1) | (3) |
| 6.2 | Prepare a list of the safety measures you would take to avoid the risk of fire when dealing with asphalt or bitumen. | (3 × 1) | (3) |
| 6.3 | List TWO types of asphalt. | (2 × 1) | (2) |
| 6.4 | State TWO dangers of using tar. | (2 × 1) | (2) |
| | | | [10] |

QUESTION 7: FASTENERS

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|-----|---|---------|-------------|
| 7.1 | Prepare a list of THREE advantages of using threaded fasteners to secure structural components as opposed to adhesives and welding. | (3 × 1) | (3) |
| 7.2 | The head of a stainless steel bolt has the inscriptions, A2-70: | | |
| | 7.2.1 Relate what the A2 stands for? | | (1) |
| | 7.2.2 Relate what the 70 stands for? | | (1) |
| 7.3 | How would you ensure that bolted connections remain secure under dynamic (vibrating) loads? | (3 × 1) | (3) |
| 7.4 | Explain why torque tensioning can be unreliable. | (2 × 1) | (2) |
| | | | [10] |

TOTAL: 100