higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

# NATIONAL CERTIFICATE (VOCATIONAL)

## MATERIALS
## NQF LEVEL 3

(12010273)

**13 November 2018 (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. Read ALL the questions carefully.
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

1.1 Indicate whether the following statements are TRUE or FALSE. Choose the answer and write only 'True' or 'False' next to the question number (1.1.1–1.1.5) in the ANSWER BOOK.

1.1.1 Shutter ply is used for roofing, flooring and shutters.

1.1.2 Plywood is made from thick layers of wood that are bonded together with adhesive.

1.1.3 Marine ply is a type of plywood designed to be used in winter.

1.1.4 Block board is used for doors, tables, shelves, partitions and panels.

1.1.5 Chipboard is a board made of wood chips and shavings and a synthetic resin.

(5 × 1) (5)

1.2 Define the term *equilibrium moisture content* and explain timber swelling, shrinkage and cupping. (4)

1.3 Explain pull-out resistance of nails and screws inserted perpendicular and parallel to the grain. (2)

1.4 Name FOUR advantages of timber constructions. (4)

**[15]**

## QUESTION 2

2.1 What are the THREE advantages and THREE disadvantages of each cutting and drilling method? (6)

2.2 Describe metals and list TWO physical properties of different metals. (4)

2.3 Explain how steel is made. (3)

2.4 List FIVE main constituents of alloys commonly used in the construction industry. (5)

2.5 What are the TWO methods of cutting metals? (2)

**[20]**

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## QUESTION 3

3.1 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 (3.1.1–3.1.3) in the ANSWER BOOK.

3.1.1 The advantage of using prefabricated steel material is:

A Reduce construction time
B Quality assurance
C Decreased precision and accuracy

3.1.2 Are made by passing a heated billet between pairs of rollers:

A Cold-rolled sections
B Hot-rolled sections
C Cool-rolled sections

3.1.3 Mild steel is steel with a low carbon content of between:

A (0,16% and 0,29%)
B (0,09% and 0,15%)
C (0,16% and 0,30%)

(3 × 1) (3)

3.2 Name THREE advantages of steel construction. (3)

3.3 Briefly describe TWO methods of fireproofing structural steel. (4)

3.4 Explain and demonstrate transporting, handling and stacking of steel sections and fabricated steel. (6)

3.5 Provide reasons for starting at a braced bay when erecting steel structures. (2)

3.6 Explain and demonstrate techniques to increase levels of tolerance of holding down (HD) bolts. (2)

**[20]**

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## QUESTION 4

4.1 Explain the effect of sea salt and strong acids on the rate of corrosion on steel. (3)

4.2 Provide the first FOUR processes of hot dip galvanising fabricated steel articles and the need for chemical controls. (4)

4.3 Explain and demonstrate the principles of detailing and fabricating articles that are hot dip galvanized. (5)

4.4 Explain why finished surfaces of galvanised components of steel structures often take up different appearances and patina from one another. (3)

**[15]**

## QUESTION 5

5.1 Explain why bronze brazing is unsuitable for joining brass components. (3)

5.2 Explain and demonstrate the correct surface preparation and fit tolerance for soldering or brazing. (6)

5.3 Demonstrate cleaning of excess flux after soldering and brazing. (4)

5.4 List and describe THREE different methods of fusion welding to join steel. (6)

5.5 Explain the structural welding code. (1)

**[20]**

## QUESTION 6

6.1 Choose the correct word(s) from those given in brackets. Write only the word(s) next to the question number (6.1.1–6.1.4) in the ANSWER BOOK.

6.1.1 Patterned glass is also called (roller glass/laminated safety glass).

6.1.2 Float glass is heated to its softening point (about 650 ºC/360 ºC), and then both surfaces are cooled very rapidly with air jets.

6.1.3 Glass that is used in construction must comply with the national building regulations (SANS 10137/SANS 10400).

6.1.4 (Back putty/bedding putty) is the glazing putty that is pressed into the rebate.

(4 × 1) (4)

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6.2 Explain the manufacturing of toughened glass. (4)

6.3 Explain the greenhouse effect of glass. (1)

6.4 Explain the danger of float glass used for glazing. (1)
**[10]**

**TOTAL: 100**

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