higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

CARPENTRY AND ROOF WORK
NQF LEVEL 2

(12020122)

2 December 2020 (X-paper)
09:00–12:00

This question paper consists of 7 pages.

177Q1N2002

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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. Start each question on a new page.
5. Use only a black or blue pen.
6. Write neatly and legibly.

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QUESTION 1: TERMINOLOGY AND TOOLS USED IN ROOF WORK

1.1 Explain what is meant by the term *hand tools.* (2)

1.2 Name TWO hand saws commonly used to cut timber during roof construction. (2)

1.3 Give examples of when each of the above saws will be used. (2)

1.4 Explain the main function of a sliding bevel and the advantage of using one. (2)

1.5 Name an alternative tool that can be used to remove nails from timber, other than a claw hammer. (1)

1.6 Give ONE word/term used for each of the following descriptions:

1.6.1 The top edge of the roof truss where the two rafters meet

1.6.2 The distance between the centres of two trusses

1.6.3 The trim board fixed to the end of overhangs

1.6.4 One of a number of trusses that make up a girder

1.6.5 The triangular timber blocks used in pairs to level trusses

(5 × 1) (5)

1.7 Draw neat line diagrams to illustrate the following truss types:

1.7.1 A fink truss

1.7.2 A scissors truss

(2 × 3) (6)

[20]

QUESTION 2: ROOF CONSTRUCTION

2.1 Briefly outline the potential problems of the following types of roof:

2.1.1 Conical roof

2.1.2 Flat roof

2.1.3 Gable roof

2.1.4 Hip roof

(4 × 2) (8)

2.2 Give THREE negative consequences that could result when roof anchors are not properly secured. (3)

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2.3 Give TWO advantages that bolted trusses have over nail plated trusses. (2)

2.4 What are the TWO main functions of a wall plate? (2)

2.5 What type of nail is best suited for securing Eco purlins? (1)

2.6 Name TWO types of roof anchors commonly used for tying down the trusses on a concrete tiled roof. (2)

2.7 Give the recommended wall plate sizes for roof spans of:

2.7.1 12 metres.

2.7.2 between 15 metres and 20 metres respectively.

(2 × 2) (4)

2.8 State TWO functions of battens. (2)

2.9 Name TWO ways of fixing purlins to the rafters of roof trusses. (2)

2.10 List FIVE loads commonly supported by roofs. (5)

2.11 Name the chemical product that can be used indoors and outdoors to protect wood from insects and fungi. (1)

2.12 What is meant by the term *timber distortion*? (1)

2.13 Give the recommended minimum sizes of square washers suitable for use with the following bolt sizes:

2.13.1 A 12 mm thick bolt

2.13.2 An 8 mm thick bolt

2.13.3 A 20 mm thick bolt

2.13.4 A bolt thicker than 20 mm

(4 × 1) (4)

2.14 List the steps taken when joining two pieces of timber with a split ring connector. (3)

[40]

QUESTION 3: BUILDING A HOWE TRUSS

3.1 The rise of a roof truss is equal to the tangent of the roof pitch multiplied by the run of the truss.

Calculate the rise of the truss if the roof pitch is 26° and the run is 1,614 metres. (2)

3.2 Choose the correct answer from those in brackets. Write only the answer next to the question number (3.2.1–3.2.5) in the ANSWER BOOK.

3.2.1 The truss overhang should be cut (during; after; before) the trusses are erected.

3.2.2 (Splayed cuts; hip cuts; plumb cuts) are made at the top end of the rafters.

3.2.3 (Butt joints; lap joints) are commonly used when building trusses on site.

3.2.4 The (3:4:5; 3:5:4; 6:8:10) method can be used to check if the centre line of the truss is square to the tie beam.

3.2.5 A (building line; chalk line; builders line) is used to strike a straight line on a flat surface.

(5 × 1) (5)

3.3 List the procedure to be followed for marking off the truss overhang on a truss template. (4)

3.4 Name TWO vertical components common to a Howe roof truss. (2)

3.5 Give detailed instructions for securing the joints on a Howe roof truss using bolts and wire nails. (7)

[20]

QUESTION 4: GABLE ROOF CONSTRUCTION

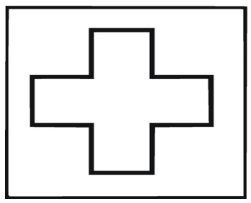
4.1 Identify the health and safety signs shown below:

4.1.1 

4.1.2 

4.1.3 

4.1.4 

4.1.5 

4.1.6 

4.1.7 

(7 × 1) (7)

4.2 List the FIVE steps taken when leveling a wall plate. (5)

4.3 Describe the different methods of installing the top chord bracing for the following:

4.3.1 A tiled roof

4.3.2 A roof covered with roofing sheets

(2 × 2) (4)

4.4 Give THREE reasons why roof bracing is essential in gable roofs. (3)

4.5 State the permissible distance allowed between the gable wall and the first truss. (1)

[20]

TOTAL: 100

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