higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

# NATIONAL CERTIFICATE (VOCATIONAL)

# CARPENTRY AND ROOFWORK

## NQF LEVEL 2

(12020122)

**28 November 2023 (Y-paper)**
**13:00–16:00**

**This question paper consists of 7 pages.**

413Q1N2328

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# DEPARTMENT OF HIGHER EDUCATION AND TRAINING
# REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)
CARPENTRY AND ROOF WORK
NQF LEVEL 2
TIME: 3 HOURS
MARKS: 100

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**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 section on a new page.
5. Use only a blue or black pen.
6. Write neatly and legibly.

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## QUESTION 1: BASIC TOOLS AND TERMINOLOGY

1.1 Identify the tools shown below in FIGURES (1.1.1–1.1.5) and state their uses.

1.1.1




Figure 1.1.1

1.1.2




Figure 1.1.2

1.1.3



Figure 1.1.3

1.1.4



Figure 1.1.4

1.1.5



Figure 1.1.5

(5 × 2) (10)

1.2 Saws are hand- held tools consisting of a wooden or plastic handle and a long, toothed metal blade.

Explain how the use of a crosscut saw differs from that of a rip saw. (2)

1.3 Name THREE power tools that carpenters use in roof construction. (3)

1.4 What does the term *mono-pitch* mean? (1)

1.5 Give a brief description of the following types of roof trusses:

1.5.1 A girder truss

1.5.2 A scissors truss

(2 × 2) (4)
**[20]**

**QUESTION 2: ROOF CONSTRUCTION**

2.1 Since the beginning of time, man has always required shelter. Name TWO natural materials that early man used as a roof covering. (2)

2.2 Give TWO benefits of having a roof over a building. (2)

2.3 Loads on a roof can be classified as either *live loads* or *dead loads*. Give THREE examples of a dead load. (3)

2.4 Explain how the design process of a deemed-to-satisfy roof differs from the design process of a rationally designed roof. (2)

2.5 Give TWO reasons why a homeowner would prefer a hip roof to a gable roof. (2)

2.6 Define the term *roof erector*. (2)

2.7 The correct size wall plates are important in roof construction. List THREE reasons why wall plates differ in size. (3)

2.8 Describe the correct way of tying down roof trusses with hoop iron straps. (3)

2.9 List THREE negative consequences of not fixing roof anchors tightly. (3)

2.10 Battens and purlins serve a similar purpose in roof construction.

2.10.1 What are the common sizes (width and thickness) of a batten and a purlin respectively?

2.10.2 What purpose do they serve in roof construction?

2.10.3 Name TWO methods of securing purlins to rafters.

(3 × 2) (6)

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2.11 Choose an item from column B that matches a description in column A. Write only the letter (A–D) next to question number (2.11.1–2.11.4) in the ANSWER BOOK.

| COLUMN A | | COLUMN B | |
|---|---|---|---|
| 2.11.1 | Used for lifting trusses with 18 to 30-metre spans | A | tag line |
| 2.11.2 | Used to lift trusses with 9 to 18-metre spans | B | belt sling |
| 2.11.3 | Keeps a truss stable so that it does not sway around in windy conditions | C | spreader bar |
| 2.11.4 | Used to lift trusses with 7 to 9-metre spans | D | strongbacks |

(4 × 1) (4)

2.12 List THREE disadvantages of factory-made, nail-plated trusses. (3)

2.13 State THREE ways in which permanent bracing stabilises a gable roof. (3)

2.14 Give the suitable batten spacing for fixing the following roofing materials:

2.14.1 Slate tiles

2.14.2 Concrete tiles

(2 × 1) (2)
**[40]**

## QUESTION 3: BUILDING A HOWE TRUSS

3.1 List the THREE stages of building a Howe roof truss. (3)

3.2 Name the FIVE different members that make up a Howe roof truss. (5)

3.3 Define the following terms used in truss construction:

3.3.1 *joint*

3.3.2 *strike a line*

(2 × 1) (2)

3.4 List the steps taken when using the 3:4:5 method for marking a 90° angle. (7)

3.5 What size of nail is commonly used for joining the members of a roof truss? (1)

3.6 Name the tool used for marking plumb cuts. (1)

3.7 How many plumb cuts must be made on a Howe truss? (1)
**[20]**

## QUESTION 4: HOW TO BUILD A GABLE ROOF

4.1 Name any TWO negative consequences of not displaying safety signs on a building site. (2)

4.2 List FOUR wall plate specifications a carpenter must know to fit wall plates. (4)

4.3 Indicate whether the following statements are TRUE or FALSE. Choose the answer and write only 'True' or 'False' next to the question number (4.3.1–4.3.5) in the ANSWER BOOK.

4.3.1 National standards provide information on how a roof should be built. All carpenters should follow these standards.

4.3.2 Roof anchors should never be more than 200 mm away from the truss or beam they are attached to.

4.3.3 In South African inland regions, all timber used in roof construction must be chemically treated.

4.3.4 Roof cladding is attached directly to rafters to strengthen it and keep it in place.

4.3.5 Health-and-safety officers represent only employees working on a building site.

(5 × 1) (5)

4.4 Explain how you would use a temporary brace to ensure that a truss remains plumb. (3)

4.5 Choose the correct word or words from those given in brackets. Write only the word or words next to the question numbers (4.5.1–4.5.6) in the ANSWER BOOK.

4.5.1 When a roof is cladded with metal sheeting, the truss spacing can be up to (750 mm/1 500 mm/2 000 mm) apart.

4.5.2 A team of (2/3/4) workers is required for the levelling and aligning of roof trusses.

4.5.3 Pairs of wedges can be inserted between (a wall plate and a tie beam/a wall and a wall plate) to align trusses.

4.5.4 A (water level/spirit level) can be used for checking whether a truss is plumb.

4.5.5 Roof anchors must be embedded in at least (3/4/6) courses of brickwork to be effective. ☆

4.5.6 Permanent bracing must be nailed securely to the (top/underside) of trusses.

(6 × 1) (6)
**[20]**

**TOTAL: 100**

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