higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

CARPENTRY AND ROOF WORK
NQF LEVEL 2

(12020122)

17 November 2022 (Y-paper)
13:00–16:00

This question paper consists of 7 pages.

429Q1N2217

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

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QUESTION 1: BASIC TOOLS AND TERMINOLOGY

1.1 Name the hand tool that is used to perform the following tasks:

1.1.1 To cut timber narrower along the grain.

1.1.2 To cut timber shorter across the grain.

(2 × 1) (2)

1.2 Give TWO uses of a combination square. (2)

1.3 What does the abbreviation SABS stand for? (1)

1.4 Choose a description from COLUMN B that matches a term in COLUMN A. Write only the letter (A–E) next to the question number (1.4.1–1.4.5) in the ANSWER BOOK.

COLUMN A		COLUMN B	
1.4.1	Tie beam	A	the sloping outer member of the truss
1.4.2	Rafter	B	the vertical member connecting the apex of a truss to bottom chord
1.4.3	Web/strut	C	secondary vertical member that helps spread the load on the rafter
1.4.4	Queen post	D	the horizontal member that is part of the heel joints
1.4.5	King post	E	the truss member that connects the top and bottom chords, usually in a triangular pattern

(5 × 1) (5)

1.5 Briefly describe the following truss types:

1.5.1 A jack truss

1.5.2 A scissors truss

1.5.3 A truncated truss

1.5.4 A mono-planar truss

1.5.5 A girder truss

(5 × 2) (10)
[20]

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QUESTION 2: ROOF CONSTRUCTION

2.1 Which type of roof has the lowest pitch? (1)

2.2 Name TWO materials early man used as a roof covering. (2)

2.3 Give THREE reasons for a roof over a building. (3)

2.4 What potential problems do the following roof types have?

2.4.1 A flat roof

2.4.2 A mono-pitch roof

2.4.3 A lean-to roof

2.4.4 A hip roof

(4 × 1) (4)

2.5 Describe the method used for tying down roof trusses with hoop iron. (4)

2.6 List THREE requirements for fixing a hurricane clip correctly. (3)

2.7 Make a neat sketch to show how a purlin is nailed to a rafter. (3)

2.8 Choose the correct word or words from those given in brackets. Write only the answer next to the question number (2.8.1–2.8.5) in the ANSWER BOOK.

2.8.1 A (rafter/tiling batten/plaster batten) supports the first row of roof tiles.

2.8.2 (Purlins/Battens/Joists) are normally used to fix cement tiles.

2.8.3 To lift large trusses with a 9- to 18-metre span, (spreader bars/belt slings/strongbacks) should be used.

2.8.4 A (general foreman/carpenter/joiner) erects a roof.

2.8.5 (Arsenic/Varnish/Bitumen) is used to prevent beetles from destroying roof timber.

(5 × 1) (5)

2.9 Prefabricated nail-plate timber trusses have several advantages.

Give FIVE advantages of prefabricated trusses. (5)

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2.10 According to the National Building Regulations, roof coverings are divided into three categories, namely class A, B and C. Name the class that the following roof coverings fall under:

2.10.1 Metal roof tiles

2.10.2 Clay tiles

2.10.3 Metal sheets

(3 × 1) (3)

2.11 Name TWO metal fittings carpenters use to join the members when building a truss. (2)

2.12 Name the metal fitting used for connecting:

2.12.1 A steel member to timber.

2.12.2 Timber to timber.

(2 × 1) (2)

2.13 Give THREE reasons why permanent bracing is essential in roof construction. (3)

[40]

QUESTION 3: BUILDING A HOWE TRUSS

3.1 Complete the following sentences by choosing a word or words from the list below. Write only the answer next to the question number (3.1.1–3.1.5) in the ANSWER BOOK.

plumb cuts; assemble; size; truss template; set out; members

3.1.1 A clean, flat surface is required for marking out a ...

3.1.2 The components of a truss are commonly referred to as truss ...

3.1.3 The joint at the apex of the truss is created by making ...

3.1.4 A claw hammer and a spanner are used to ... a truss.

3.1.5 Two people are needed to ... a truss.

(5 × 1) (5)

3.2 Explain the difference between *clear span* and *tie beam span*. (2 × 2) (4)

3.3 Give a brief definition of the following setting-out terms:

3.3.1 Run (2)

3.3.2 Rise (2)

3.3.3 Pitch (1)

3.4 Make a neat, labelled drawing that shows the overhang of a truss.

The following must be clearly indicated:
- The rafter
- The tie beam
- The wall plate
- The supporting wall
- The overhang (6)

[20]

QUESTION 4: BUILDING A GABLE ROOF

4.1 Explain why it is much safer to have warning signboards instead of written instructions on a building site in South Africa. (2)

4.2 Give an advantage and a disadvantage of wearing ear-plugs on a building site. (2)

4.3 Name the act that protects employees in the workplace. (1)

4.4 List the specifications of a *category-D* roof. (2)

4.5 What is the function of wall-plates, and where would you find them? (3)

4.6 State the correct position of the first and the last truss of a gable roof. (2)

4.7 Give the recommended truss spacing for the following roof coverings:

4.7.1 Corrugated iron sheets on 50 mm × 75 mm purlins.

4.7.2 Cement tiles on 38 mm × 38 mm battens.

4.7.3 Concrete tiles on 38 mm × 50 mm battens.

(3 × 1) (3)

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4.8 Indicate whether the following statements are TRUE or FALSE by writing only 'True' or 'False' next to the question numbers (4.8.1–4.8.5) in the ANSWER BOOK.

4.8.1 The apex is used as a reference point when trusses are aligned.

4.8.2 A plumb line is used to check if trusses are level.

4.8.3 A skew nail is used to attach permanent bracing.

4.8.4 Roof anchors must be embedded for at least 4 courses into the brickwork.

4.8.5 A roof anchor must be fixed to every alternate truss.

(5 × 1) (5)
[20]

TOTAL: 100

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