higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

CARPENTRY AND ROOF WORK
NQF LEVEL 3

(12030333)

27 November 2023 (X-paper)
09:00–12:00

This question paper consists of 5 pages.

353Q1N2327

Copyright reserved

DEPARTMENT OF HIGHER EDUCATION AND TRAINING
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)
CARPENTRY AND ROOF WORK
NQF LEVEL 3
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.

Copyright reserved

QUESTION 1

1.1 Choose a description from COLUMN B that matches a term in COLUMN A. Write only the letter (A–F) next to the question number (1.1.1–1.1.5) in the ANSWER BOOK.

COLUMN A		COLUMN B	
1.1.1	Pitch	A	part of a truss that forms the top edge at a slope with battens/purlins fixed to carry the roof cover
1.1.2	Strut	B	usually horizontal, supports the ceiling and stops rafters from spreading
1.1.3	Node	C	angle between the top and horizontal line from the support point expressed in degrees
1.1.4	Bottom chord	D	stretches from one wall to another across a room/building also known as a span
1.1.5	Top chord	E	part on a roof truss where two or more truss members are connected to each other to form a truss joint
		F	secondary member that connects the top chord and bottom chord usually in a triangular pattern also known as a web

(5 × 1) (5)

1.2 List FIVE factors that influence roof stability. (5)

1.3 Explain the term *rational design* as it relates to roof construction. (2)

1.4 List the 13 steps, in the correct order, that carpenters should follow when erecting a hipped roof. (13)

1.5 When is a rational design needed in roof construction? (2)

1.6 Give THREE reasons why national standards are important during roof construction. (3)

[30]

QUESTION 2

2.1 Give TWO examples of each of the following loads applicable to roof construction:

2.1.1 Dead load

2.1.2 Live load

(2 × 2) (4)

2.2 Explain the term *roof truss*. (2)

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

2.4 Explain the term *competent person* as it relates to designing and developing a rational designed roof. (2)

2.5 Explain why the slope of a valley gutter is lower than the slope of the intersecting roofs. (2)

2.6 List THREE types of valley gutters commonly used on South African roofs. (3)

2.7 Give the formula used to calculate the pitch/gradient of a gabled roof. (1)

2.8 Explain the term *drive home* as it relates to carpentry and roof work. (2)

2.9 List the 10 steps to follow when erecting an L-shaped roof. (10)

2.10 Give ONE function of a wall plate. (1)

[30]

QUESTION 3

3.1 List FIVE regulations and associations that guide roof inspections. (5)

3.2 Indicate whether the following statements are TRUE or FALSE by writing only 'True' or 'False' next to the question number (3.2.1–3.2.3) in the ANSWER BOOK.

3.2.1 A roof erector is in charge of erecting a roof.

3.2.2 An artisan is qualified after being trained as an apprentice and successfully completing a trade test.

3.2.3 A professional engineer is a qualified engineer who is registered under the Engineering Professional Act 46 of 2000.

(3 × 2) (6)

3.3 Give FOUR disadvantages of poor roof inspection. (4)

[15]

Copyright reserved

QUESTION 4

4.1 Choose a roof material from the list below that matches the class of roof covering. Write only the material or materials next to the question number (4.1.1–4.1.3) in the ANSWER BOOK.

metal; fibre-cement sheets; concrete tiles; fibre-cement tiles; metal roof tiles; clay tiles; natural slates

4.1.1 Class C

4.1.2 Class A

4.1.3 Class B

(3 × 1) (3)

4.2 Choose the correct weight from COLUMN B that matches a roof covering in COLUMN A. Write only the letter (A–G) next to the question number (4.2.1–4.2.7) in the ANSWER BOOK.

COLUMN A		COLUMN B	
4.2.1	Natural slate	A	4,1 to 12 kg/m²
4.2.2	Concrete tiles	B	3,5 kg/m²
4.2.3	Thatch 100 mm thick	C	11 kg/m²
4.2.4	Pressed metal tiles	D	48 to 54 kg/m²
4.2.5	Fibre-cement sheeting	E	10 to 12 kg/m²
4.2.6	Metal roof sheeting	F	35 kg/m²
4.2.7	Polycarbonate roof sheeting	G	47 to 78 kg/m²

(7 × 1) (7)

4.3 Name the FOUR parts of a roof that are the most vulnerable to wind. (4)

4.4 Explain why it is not permissible to change specified roof material without authorisation from the designer. (2)

4.5 List NINE elements of a design that will be affected by roof covering materials. (9)

[25]

TOTAL: 100

Copyright reserved