



**higher education
& training**

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

**CARPENTRY AND ROOF WORK
NQF LEVEL 2**

NOVEMBER 2010

(12020122)

**25 November (X-Paper)
09:00 – 12:00**

This question paper consists of 6 pages.

<p>TIME: 3 HOURS MARKS: 100</p>

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. ALL sketches must be neat and clear.
 5. ALL work you do not want to be marked, must be clearly crossed out.
 6. Start each question on a NEW page.
 7. Rule off across the page on completion of each question.
 8. Full marks = 100%
 9. All abbreviations and symbols must comply with the latest National Building Regulations and all relevant SANS (SABS) codes.
 10. Write neatly and legibly.
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QUESTION 1: GENERAL

- 1.1 Name FOUR hand tools used in roof construction. (4)
- 1.2 Name ONE safety item that should be worn when using a hammer drill. (1)
- 1.3 Define the term *plumb*. (1)
- 1.4 Name TWO functions of a washer when using nuts and bolts in roof truss construction. (2)
- 1.5 Safety on a building site is very important. State THREE precautions that you would take when working on a roof. (3)
- 1.6 What is the most common roof truss used in mass low-cost housing projects? (1)
- 1.7 Which part of a roof truss can also be referred to as a *rafter*? (1)
- 1.8 Give TWO reasons why nail-plate connected trusses are stronger than bolted trusses. (2)
- [15]**

QUESTION 2: TERMINOLOGY IN ROOF WORK

- 2.1 Complete the following paragraph by using the words in the list below. Write only the word(s) next to the question number (2.1.1 – 2.1.10) in the ANSWER BOOK.

strong; bottom chords; monopitch; double; heel; top chords; 90° angle; support; damage; slope; hip girder; braces

DIFFERENT TYPES OF ROOF TRUSSES

In a (2.1.1) ... jack truss, there is only one rafter (2.1.2) You could say that this truss is half a (2.1.3) ... pitch truss. The (2.1.4) joins the tops of the jack trusses. A valley truss is supported on the top chords of other trusses at a (2.1.5) The top chord does not go past the (2.1.6) A scissors truss has sloping (2.1.7) ... and sloping (2.1.8) A girder truss is a (2.1.9) ... single or multiple-ply truss used to (2.1.10) ... other trusses.

- (10 × 1) (10)
- 2.2 Give TWO examples of dead loads in a roof structure. (2)
- 2.3 Which term is used to indicate the horizontal distance that rafters stick out past the outside walls? (1)
- 2.4 State, with reference to a roof, where you would fit fascia boards. (1)

- 2.5 Name TWO types of galvanized roof connectors. (2)
- 2.6 Battens and brandering are similar in size, yet they perform different functions. Name TWO fixing areas and the function of each. (4)
- 2.7 In certain cases, the members used in roof-truss construction have more than one name. Give another name for each of the following:
- 2.7.1 Bottom chord (1)
- 2.7.2 Slope (1)
- 2.7.3 Binder (1)
- 2.7.4 Roof cladding (1)
- 2.8 State TWO instances where 32 mm clout nails could be used during roof construction. (2)
- [26]**

QUESTION 3: ROOF CONSTRUCTION

- 3.1 Name TWO materials which early man used as roof covering. (2)
- 3.2 Which type of roof, with its double slope design, makes it possible to build larger attics and wider staircases? (2)
- 3.3 List THREE live loads that a roof structure should be able to withstand. (3)
- 3.4 Give a brief description of the following roof structures:
- 3.4.1 Gable-to-gable roof (2)
- 3.4.2 Hip roof (2)
- 3.4.3 Lean-to roof (2)
- 3.4.4 Flat roof (2)
- 3.5 Indicate whether the following statements are TRUE or FALSE. Choose the answer and write only 'true' or 'false' next to the question number (3.5.1 – 3.5.5) in the ANSWER BOOK.
- 3.5.1 A wall plate measuring 38 mm x 76 mm is suitable for a roof span of 15 metres. (1)
- 3.5.2 The maximum centre-to-centre truss spacing for concrete tiles is 950 mm. (1)

- 3.5.3 Wall plates are always supported on the outermost skin of brickwork. (1)
- 3.5.4 Rationally designed roofs are normally designed by engineers using calculations. (1)
- 3.5.5 Good communication between roof designers and roof erectors is essential to ensure that roof anchors are positioned accurately. (1)
- 3.6 State TWO methods of securing purlins to rafters. (2)
- 3.7 List THREE benefits of correctly transporting, handling and storing roof trusses. (3)
- 3.8 Give THREE reasons why permanent bracing is important in roof construction. (3)
- [28]**

QUESTION 4: GABLE ROOF CONSTRUCTION

- 4.1 Various options are given as possible answers to the following questions. Choose the correct answer and write only the letter (A – D) next to the question number (4.1.1 – 4.1.5) in the ANSWER BOOK.
- 4.1.1 Safety signs on a building site that everyone can understand are essential because workers often speak ... language(s). (1)
- A one
B several
C different
D foreign
- 4.1.2 The law states that every company with more than ... employees must have a safety and health representative. (1)
- A 60
B 20
C 25
D 50
- 4.1.3 Timber used for roof construction must be ... to prevent fungal and termite attacks. (1)
- A varnished
B planed all round
C painted
D treated

- 4.1.4 Nail plate connections can only be used in ...
 A splayed joints.
 B butt joints.
 C lap joints.
 D bolted joints. (1)
- 4.1.5 A gable wall is usually ...
 A thicker than a truss.
 B lower than a truss.
 C much higher than a truss.
 D the same shape as a truss. (1)
- 4.2 List the FIVE steps to be followed when levelling a wall plate. (5)
- 4.3 How far must the first and last trusses be placed from the inside of the gable walls? (1)
- 4.4 State TWO factors that will affect the spacing between roof trusses. (2)
- 4.5 SANS 10243 recommends the use of a gauge rod when spacing trusses. What is a *gauge rod*? (2)
- 4.6 Which fixing method is used when attaching temporary braces? (1)
- 4.7 When levelling and aligning roof trusses, three people are required to do the job. Explain the duties of each. (2)
- 4.8 List THREE pieces of equipment that will be used in the process in QUESTION 4.7. (3)
- 4.9 Explain how trusses are permanently fixed to the wall structure. (3)
- 4.10 What is the minimum size of timber used for the permanent bracing of trusses? (1)
- 4.11 State TWO purposes of laying plastic underlay in a roof structure. (2)
- 4.12 What is the minimum distance that the plastic underlay in QUESTION 4.11 must overlap on a gable roof? (1)
- 4.13 Describe a *tilting batten* and say where on a roof it is fixed. (3)
- [31]**
- TOTAL: 100**