higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

CARPENTRY AND ROOF WORK
NQF LEVEL 3

(12030333)

9 March 2018 (X-Paper)
09:00–12:00

This question paper consists of 6 pages.

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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. All work you do not want to be marked must be clearly crossed out.
5. Start each question on a new page.
6. Rule off across the page on completion of each question.
7. All abbreviations and symbols must comply with the latest National Building Regulations and all relevant SANS (SABS) codes.
8. Write neatly and legibly.

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QUESTION 1: HIPPED ROOFS

1.1 State the THREE main elements which define a rationally designed roof. (3)

1.2 FIGURE 1 below shows the plan view of one end of a hipped roof.

Study the plan carefully and answer the questions.

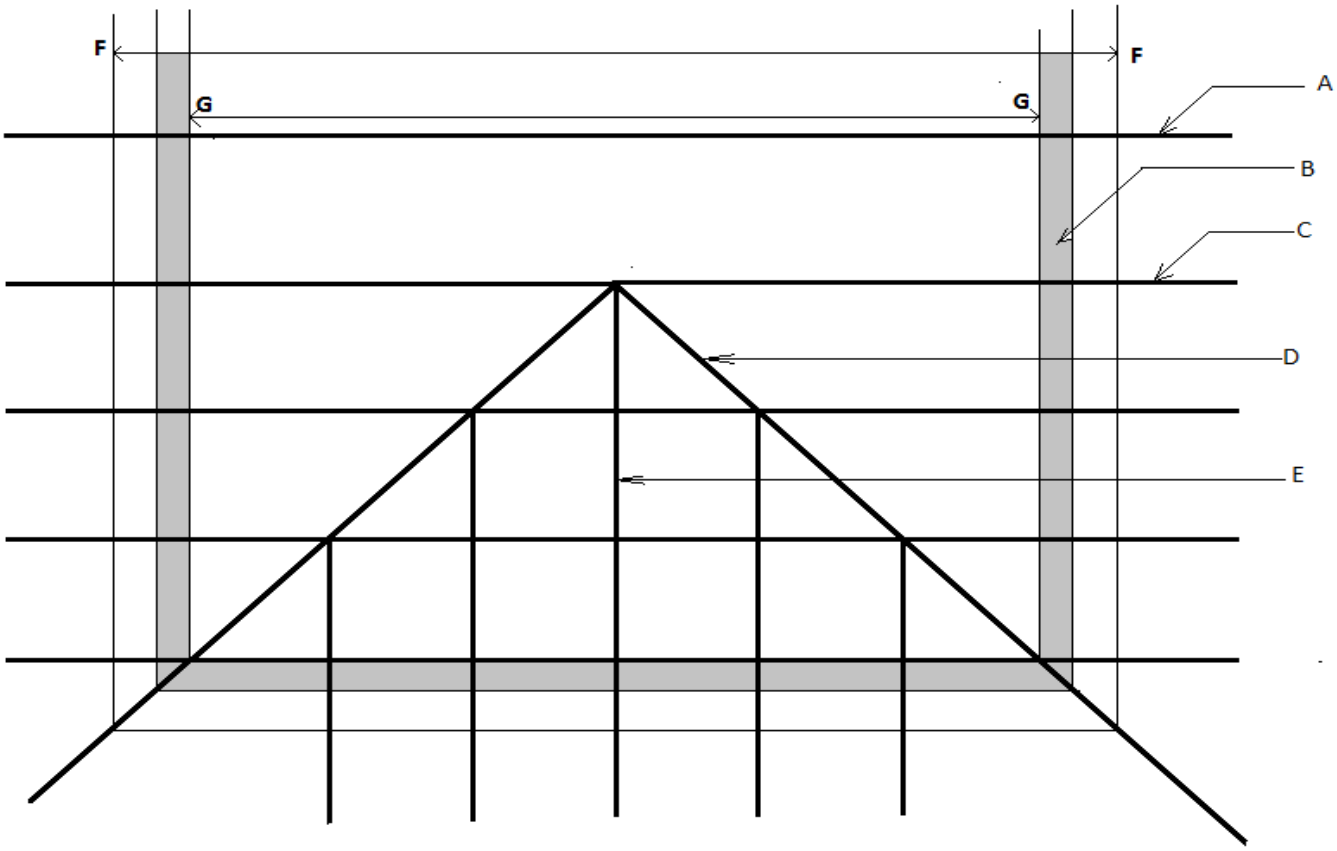


FIGURE 1

1.2.1 What does member A represent?

1.2.2 B is a critical component fixed on the inner leaf of the wall.

What is it known as?

1.2.3 Member C provides extra support to the roof structure.

What is this member commonly known as?

1.2.4 Name the structural member marked D.

1.2.5 Give the correct name of the member marked E.

1.2.6 How many jack trusses are shown in the plan?

1.2.7 What is the distance between F and F known as?

1.2.8 What is the distance between G and G known as?

(8 × 2) (16)

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1.3 Indicate whether the following statements are TRUE or FALSE. Choose the answer and write only 'true' or 'false' next to the question number (1.3.1–1.3.5) in the ANSWER BOOK.

1.3.1 Gutters are attached to the fascia boards before the roof covering is fitted.

1.3.2 A gable roof is more aerodynamic than a hipped roof.

1.3.3 A carpenter may not design or make the trusses for a hipped roof.

1.3.4 All roof types must be inspected and certified by a registered structural engineer once construction is completed.

1.3.5 The edges of a roof that protrude beyond the walls are known as the eaves.

(5 × 1) (5)

1.4 State the differences between a roof covered with IBR or corrugated sheets and a tiled roof with reference to each of the following aspects:

1.4.1 Truss spacing

1.4.2 Purlins and battens

1.4.3 Underlay

(3 × 2) (6)

[30]

QUESTION 2: ERECTING AN L-SHAPED ROOF

2.1 Why is the girder truss in an L-shaped roof much longer than the common trusses? (2)

2.2 On which TWO types of roofs would you find valleys? (2)

2.3 Name THREE types of valley gutters commonly known and used in South Africa. (3)

2.4 Give THREE reasons why an L-shaped roof should never be built without a rational design. (3)

2.5 Why is it important to construct a good solid valley gutter? (3)

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2.6 For the purpose of erecting roof trusses, arrange the following steps in the correct order. Write down only the letters (A–F) in the correct sequential order next to the question number (2.6) in the ANSWER BOOK.

A Line up trusses
B Set out truss positions
C Ensure that scaffold is firm and steady
D Raise trusses safely
E Level trusses correctly
F Fix wall plate

(6 × 2) (12)

2.7 Name any FIVE tools a carpenter will need when erecting an L-shaped roof. (5)
[30]

QUESTION 3: INSPECTION OF ROOF STRUCTURES

3.1 What are the responsibilities of each of the following individuals with regard to effective roof inspection?

3.1.1 The building owner

3.1.2 The roof erector

3.1.3 The occupant of the house

3.1.4 The designing engineer

(4 × 2) (8)

3.2 Name FOUR important points that must be considered during proper roof structure inspection. (4)

3.3 State the negative consequences of each of the following:

3.3.1 Spacing trusses too far apart

3.3.2 Using untreated timber

3.3.3 Using battens that are of the incorrect thickness

(3 × 1) (3)
[15]

QUESTION 4: ROOF CLADDING

4.1 In order of their weight per m^2, arrange the following roof-covering materials from the lightest to the heaviest. Write only the correct question number (4.1.1–4.1.7) in the correct order in the ANSWER BOOK.

4.1.1 Metal tiles

4.1.2 Fibre cement sheets

4.1.3 Polycarbonate sheets

4.1.4 Thatch

4.1.5 Concrete tiles

4.1.6 Natural slate

4.1.7 Metal sheets

(7 × 1) (7)

4.2 What relationship must exist between the roof pitch and its ability to shed rainwater? (2)

4.3 State the minimum overlap of the plastic underlay on each of the following roofs:

4.3.1 A roof with gable ends

4.3.2 A hipped roof

(2 × 1) (2)

4.4 List SIX elements of a roof design that could be affected by the choice of the roof-covering material. (6)

4.5 What type of roofing material would you expect to find on a class C roof? (1)

4.6 State FIVE factors that must be considered before fixing concrete roof tiles. (5)

4.7 Bituminous aluminium paint is used to prevent 'white rust' from occurring on galvanised roofing sheets.

Give TWO reasons why this product can be beneficial to a roof. (2)

[25]

TOTAL: 100

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