higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE

CARPENTRY AND ROOFING THEORY N2

1 December 2023

This marking guideline consists of 8 pages.

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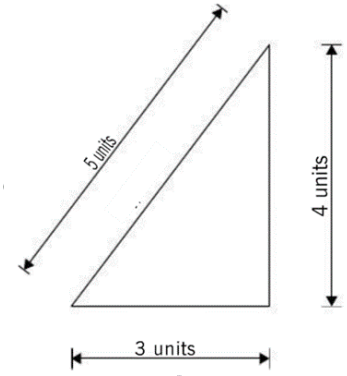
QUESTION 1

1.1

1.1.1	B
1.1.2	B
1.1.3	C
1.1.4	A
1.1.5	A
1.1.6	B

(6 × 1) (6)

1.2

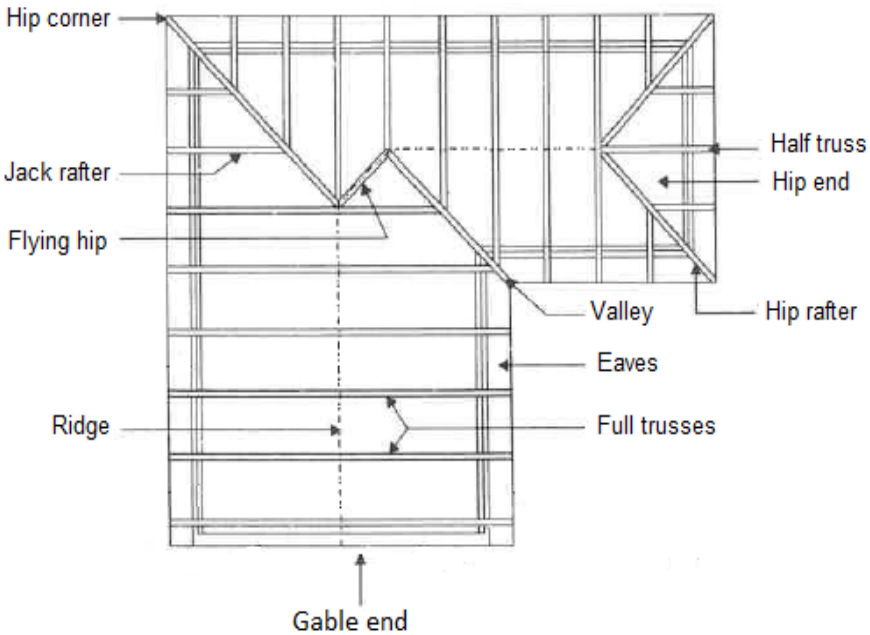


Triangle	1
3;4;5 method	3
Total	4

(4)
[10]

QUESTION 2

2.1



Sketch:	6
Flying hip:	2
Gable end:	1
Hipped end:	1
Other labels: (8 × ½)	4
Correctness:	2

(16)

2.2 2.2.1 A king post is the main support member in a Howe roof truss. It is positioned vertically in the middle of the truss to spread the load on the rafters.

2.2.2 The queen post is the secondary support member in a roof truss. It is also positioned vertically in the truss to help spread the load to the rafters.

(Any relevant 2 × 2) (4)
[20]

QUESTION 3

3.1
- Plastics
- Mastics
- Acrylic
- Asphalt

(Any 3 × 1) (3)

3.2
- Water-resistant
- Resistant to rust and corrosion
- Cost
- Availability
- Durability
- Influence of climatic conditions and changes
- Reflection and absorption of heat and cold

(Any 5 × 1) (5)

3.3 3.3.1
- It is easily affected by strong wind due to its light weight.
- It can break easily.

(Any relevant 1 × 1) (1)

3.3.2
- It can rust easily if not treated properly.
- It is not a good isolator.

(Any relevant 1 × 1) (1)

3.3.3
- It is not fireproof.
- It can be expensive, especially in South Africa.

(Any relevant 1 × 1) (1)

3.4 3.4.1 17^{o}

3.4.2 10^{o}

3.4.3 35^{o}

3.4.4 1^{o}

(4 × 1) (4)
[15]

QUESTION 4

- Establish the height of the ceiling and fix the wall angles to the required height on the walls.
- Use nylon lines to determine the centre lines between the four walls at the height of the wall angles where every two lines intersect each other at right angles at the centre of the room.
- Install hanger inserts on the concrete ceiling for the main T-bars and the cross T-bars at all intersecting points.
- Fix the suspended hanger wires to tie the T-bars to the hanger inserts fixed to the concrete ceiling.
- Bend the hanger wires at the bottom where it will be tied, exactly in line with the wall angles.
- Cut the main and cross T-bars to the required lengths and fit the main T-bars between the facing walls. Fit the cross T-bars between the main T-bars and the wall angles.
- Set the main and cross T-bars square to each other, lock them and fix the cross T-bars to the wall angles by means of pop riveting.
- Install the ceiling panels in their positions and insert the holding-down clips over the T-bars to hold the panels down. **[8]**

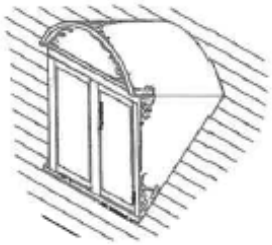
QUESTION 5

5.1
5.1.1 Bottom rail of window frame
5.1.2 Mortar
5.1.3 Cill of dormer
5.1.4 Concealed lead
5.1.5 Felt
5.1.6 Roof tiles of main roof
5.1.7 Lower trimmer

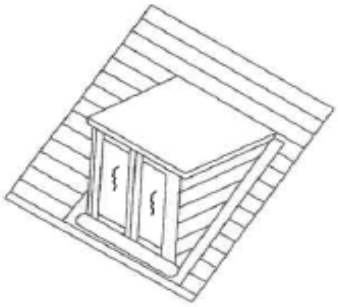
(7 × 1) (7)

5.2
- Dormer with segmental roof
- Dormer with flat roof
- Dormer with pitched roof (3)

5.3



Dormer with segmental roof



Dormer with flat roof



Dormer with pitched roof

Any one	
Sketch:	3
Name:	1
Correctness:	1

(5)
[15]

QUESTION 6

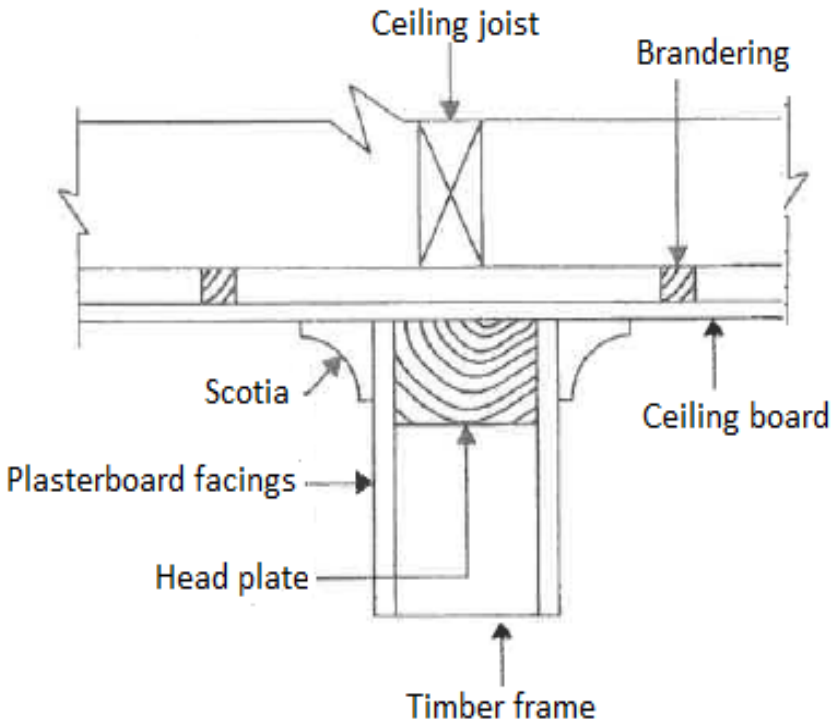
6.1
- Decide where the roof light must be installed and measure and mark the position.
- Create an opening between the rafters and cut away the battens if necessary.
- Built a timber frame in the opening according to the size of the roof light.
- Apply waterproofing, a sticky rubber strip, to the underside of the plastic roof light.
- Press it tightly down over the opening until the roof light is set.
- Replace the roof covering around the roof light.
- Apply flashing and sealant to cover any openings between the roof light and the main roof. (7)

6.2
- It provides lighting to top floors where roofs are flat.
- It provides natural light in homes, especially in rooms where there are no side windows available.
- It provides ventilation in the building if it can open. (Any relevant 3 × 1) (3)

6.3 Patent glazing is a structural concept in glass roof construction where the installation of glass can be done with any number of puttyless methods. It is metal glazing-bars supporting the glass without putty, employed in roofs and walls. Its dry construction enables speed of erection (Any relevant 2 × 1) (2)
[12]

QUESTION 7: CARPENTRY CANDIDATES ONLY

7.1



Sketch: 3
Timber partition: 1
Labels: (6 × ½) 3 (7)

7.2

- Position the metal door frame within the door opening, ensuring it is level and plumb.
- Make sure that the rebate is on the correct side for a door that must open to the inside or outside.
- Place weights on the tie bars and check for squareness using a builder's square.
- Use two timber stays with nails knocked halfway into the top ends and hooked on to the top part of the frame to keep it plumb.
- Lay a floor plate across the doorway and secure it with bricks or blocks to prevent movement.
- Insert shims between the door frame and the rough opening to adjust the position of the frame if the opening is not perfectly square or straight.
- When it is plumb, fix one or two stiffeners in-between the jambs to avoid inwards bowing with the pressure of the mortar. (Any relevant 7 × 1) (7)

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7.3 7.3.1 All the joints of the formwork should be closed and tight-fitting to prevent any grout loss or leakage of the concrete.

7.3.2 The form faces should be simple to permit an easy method of striking, consistently achieving the desired concrete finish and enabling the required number of reuses.

7.3.3 Formwork for reuse should be cleaned, oiled and properly stored under a cover to prevent twisting and/or bending.

(3 × 2) (6)
[20]

QUESTION 8: ROOFING CANDIDATES ONLY

8.1 8.1.1
- It is a ferrous metal and bluish white in colour.
- It is coated with a thin film of zinc to protect it from rust and corrosion.
- It is hard and durable.
- It can easily be hard soldered and welded. (Any TWO)

8.1.2
- It is malleable and ductile.
- It is very light and soft.
- It is rustproof and corrosion resistant. (Any TWO)

8.1.3
- It is a tough material.
- It is rust-free.
- It is reasonably soft.
- It is malleable and ductile.
- It hardens when stretched. (Any TWO)

8.1.4
- It is soft but heavy.
- It is malleable.
- It is rustproof.
- It is flexible. (Any TWO)

(4 × 2) (8)

8.2 8.2.1 Waterproofing means to seal off a joint so that no water can seep through, e.g., at a joint between a roof and chimney or a roof and parapet wall.

8.2.2 Weatherproofing is the process where a structure is protected against the elements of the weather, e.g., the rain, radiation of the sun, etc. and to apply varnish for external use to wood.

(2 × 2) (4)

8.3
- The surface where the membrane is to be fixed must be clean and dry.
- All loose particles must be brushed off.
- The required length must be cut off and the protective layer removed.
- The membrane must then be pressed in position with firm even strokes.
- In extreme cases the membrane can be tapped very lightly with a hammer and block. (Any 4 × 1) (4)

8.4 8.4.1 Used to mark dimensions on tiles

8.4.2 Used to hook out nails when tiles must be replaced

8.4.3 Used to cut any timber in the roof structure that needs to be cut

8.4.4 Used to drill holes in tiles or slates to fix it to the battens

(4 × 1) (4)

[20]

TOTAL: 100

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