higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE (VOCATIONAL)

CONSTRUCTION PLANNING
NQF LEVEL 2

15 November 2024

This marking guideline consists of 7 pages.

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QUESTION 1

1.1 1.1.1

- A servitude is a registered right that a person has over the immovable property of another. ✓
- It allows the holder of the servitude to do something with the other person's property, which may infringe upon the rights of the owner of that property.
- It is the right of way to travel over a section of the other person's property in order to reach your own property. (Any 1 × 2)

1.1.2

- A line usually set with respect to the frontage of a plot of land which is fixed by statute or by deed or contract and beyond which the owner of the land may not build.
- A line established by the local council which is the minimum distance that must be maintained between the building and the street or road boundary. (Any 1 × 2)

(2 × 2) (4)

1.2

- Brick,
- Building stone
- Such as marble
- Granite
- Limestone
- Cast stone
- Concrete block
- Glass block (Any ONE) (1)

[5]

QUESTION 2

2.1

2.1.1 D
2.1.2 E
2.1.3 A
2.1.4 B
2.1.5 C

(5 × 1) (5)

2.2

2.2.1 3
2.2.2 9
2.2.3 6

(3 × 1) (3)

2.3 Area = l × b
= 250 m × 2,5 m✓
= 625 m² ✓ (2)

[10]

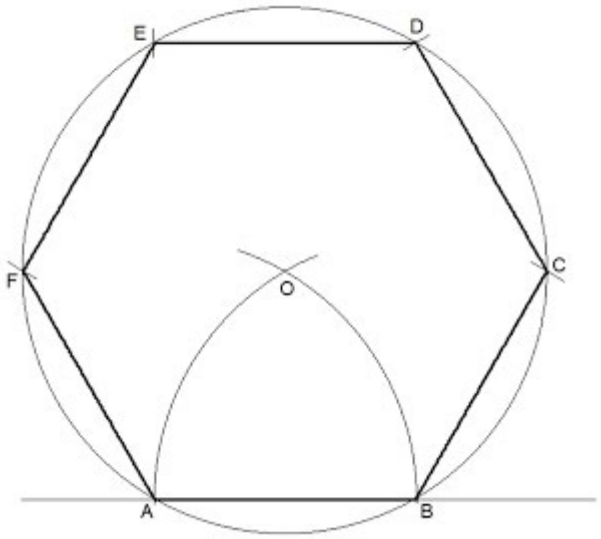
QUESTION 3

3.1 They are affected by moisture and can shrink.
The length may change when stretched.
It is likely to twist, giving wrong readings. (3)

3.2 3.2.1 1.34
3.2.1 5.542
(2 × 1) (2)

3.3
- Mark off the width of the wall and trenches using nails on profile board.
- String a builder's line from the nails on the profile boards to indicate the width of the foundation trenches.
- Pour building sand directly under the lime to transfer trench width line into the ground.
- The foundation line may also be transferred to the ground by using a point of a pick.
- Excavate down to the required level. (5)

3.4



(6)

3.5
- It needs two people to operate.
- Takes time for water to settle after movements.
- There is room for parallax error.
- Bubbles in the water can give inaccurate reading.
- If the water spills out, you need to start all over. (Any 3 × 1) (3)

3.6 Hold a white paper in front of the theodolite✓ and using the eye piece, get a clear view of the stadia hairs.✓
Then using a focusing screw,✓ focus on various far objects until you get clear and sharp images.✓ (4)

3.7 Tacheometry is the branch of survey where the distances and elevations are calculated from instrumental observations. (2)
[25]

QUESTION 4

4.1 To provide a continuous, level (or sometimes stepped) strip of support to a linear structure such as a wall or closely spaced rows of columns built centrally above them. (2)

4.2
- The foundation must have an adequate depth to prevent frost damage**.**
- The foundation must be safe against a bearing capacity failure**.**
- The foundation must not settle to such an extent that it damages the structure.
- The foundation must be of adequate quality so that it is not subjected to deterioration, such as from sulfate attack.
- The foundation must be designed with sufficient strength that it does not fracture or break apart under the applied superstructure loads.
- The foundation must also be properly constructed in conformance with the design specifications.
- The foundation must be able to resist long-term adverse soil changes.
- The foundation must be able to support the structure during an earthquake without excessive settlement or lateral movement. (Any 4 × 1) (4)

4.3
- Raft foundation is a reinforced concrete slab covering the entire area of the building.
- A thick concrete slab resting on a large area of soil reinforced with steel, supporting columns or walls and transferring loads from the structure to the soil.
- The depth of the foundation depends on the size of the building and all the walls and pillars are built on this foundation. (Any 2 × 2) (4)

[10]

QUESTION 5

5.1 Area of outer walls and inner walls
= 2[2(6 × 8) + 2(12 × 6)]✓
= 2[96 m² + 144 m²]
= 480 m²✓

Deduct window and door
= 2[2(2 × 2) + (1.5 × 2)] ✓
= 2[8m² + 3 m²]
= 22 m²✓

Total outer area
= 480 m² – 22 m² ✓
= 458 m²✓ (6)

5.2 Area of wall
= 15 m × 2,5 m
= 37,5 m²✓

Area of brick in metres
= 220 × 75 mm✓

In metres
= 0,22 m × 0,075 m
= 0,0165 m²✓

No of bricks needed
$= \frac{37,5\ m^2}{0,0165\ m^2}$
= 2 272,72 bricks✓
= 2 273 bricks (4)
[10]

QUESTION 6

6.1.1 These are freehand✓ drawings just to communicate the idea.✓

6.1.2 More detailed drawings show the actual appearance✓ of the structure with different views of the structure.✓

6.1.3 Intended for the actual erection of the structure✓
It has all the detailed plans of all elements for construction.✓
(3 × 2) (6)

6.2
- Zoning
- Boundaries
- Height restrictions
- Servitudes
- Sewer connection (Any 4 × 1) (4)

6.3 A = 30 – 10 – 5 = 15✓

B = 20 – 10 = 10✓

C = $\sqrt{\text{opposite}^2 + \text{adjacent}^2}$✓

= $\sqrt{5^2\ m + 10^2\ m}$✓

= 11,18 m²✓ (5)
[15]

QUESTION 7

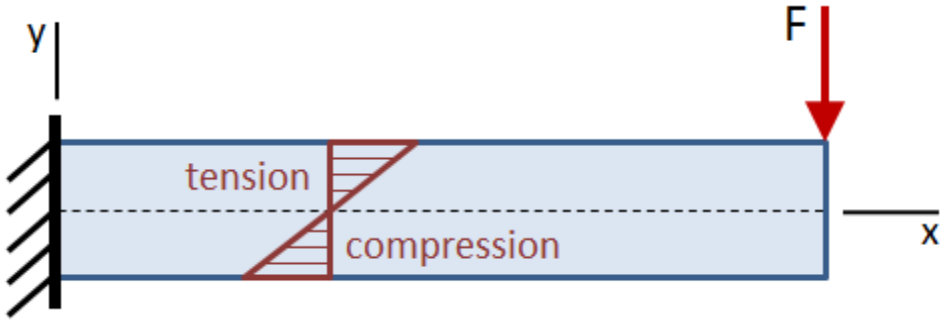
7.1
- A tie is a linear structural component designed to resist tension.✓ Ties may be made of any tension-resisting material.✓
- A strut is a structural component that provides outwards-facing support in their lengthwise direction, which can be used to keep two other components separate.✓ Struts generally work by resisting longitudinal compression.✓ (2 × 2) (4)

7.2
- In a five-hinge failure, when point load is applied at the centre, the sides of the arch bulges and breaks.
- In a four-hinge failure, the bulking occurs at different places on the arch.

(2 × 2) (4)

7.3 The effective length
Slenderness ratio
Radius of gyration
The eccentricity of loading
Straightness of column (Any 4 × 1) (4)

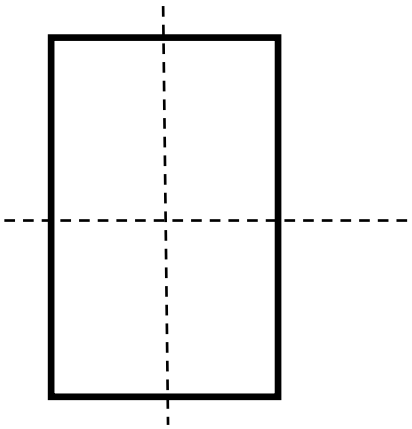
7.4



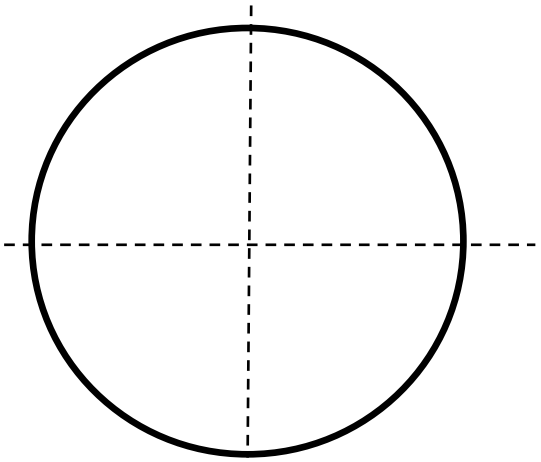
(5)

7.5 Marks should be awarded for the correct positions of the TWO neutral axes.

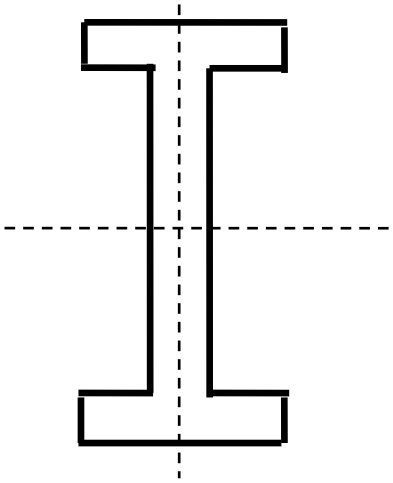
7.5.1



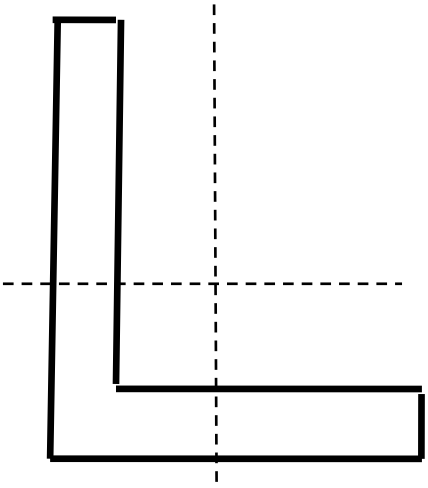
7.5.2



7.5.3



7.5.4



(4 × 2) (8)
[25]

TOTAL: 100

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