



**higher education  
& training**

Department:  
Higher Education and Training  
**REPUBLIC OF SOUTH AFRICA**

# **MARKING GUIDELINE**

**NATIONAL CERTIFICATE**

**BUILDING AND STRUCTURAL SURVEYING N5**

**27 MARCH 2018**

**This marking guideline consists of 4 pages.**

**INSTRUCTIONS**

1. Mark with a red pen.
2. Do not draw lines through wrong answers.
3. Write the marks for each answer in the right margin and the TOTAL for a complete question in a circle in the left margin.
4. Use discretion should there be more than one possible correct answer/formula/sketch to evaluate and allocate marks accordingly.

**QUESTION 1**

- 1.1 Back site and fore site
- 1.2 Level
- 1.3 Steel
- 1.4 150 mm
- 1.5 Three people

(5 × 2) [10]

**QUESTION 2**

- 2.1 False
- 2.2 True
- 2.3 False
- 2.4 True
- 2.5 False

(5 × 2) [10]

**QUESTION 3**

- 3.1 A change point is both a fore sight and a back sight, as readings are taken from two instrument positions and the readings are written down on the same line.
- 3.2 Any reading that does not qualify as a back sight or fore sight is an intermediate sight and is usually taken between the fore sight and the back sight.
- 3.3 Fore sight is the last reading taken before the instrument is moved.
- 3.4 A back sight is that first sight taken after the levelling instrument has been set up.
- 3.5 A bench mark is a fixed point of known height and it is usually a steel/copper pin solidly fixed in a position where it is unlikely to be disturbed or destroyed.

(5 × 3) [15]

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**QUESTION 4**

- 4.1 Co-ordinates are measured perpendicular from both the x-axis and y-axis.✓  
The direction is measured clockwise from the positive x-axis (zero).✓ Each point will have one direction✓ and two co-ordinates.✓ (4)
- 4.2 Wrong reading  
Incorrect booking  
Measuring the slope of the ground instead of the slope of the tape  
Reading members incorrectly  
Tapes not kept on the zero mark  
Booking wrong figures for correct measurements (Any 4 × 1) (4)
- 4.3  $\frac{a+b}{2} \times h$ ✓  
 $\frac{74+39}{2} \times 24$ ✓  
 $= 56,6 \times 24$ ✓  
 $= 1\,356\text{ m}^2$ ✓  
 $= 1\,356\text{ ha}$ ✓✓ (6)
- 4.4 Bay =  $\frac{120}{3} = 40\text{ m}$ ✓  
Cct =  $\frac{(w^2)L^3}{24(T)^2}$   
 $= \frac{(0,015)^2 (40)^3}{24 (7)^2}$  ✓  
 $= 0,012\text{ m per bay}$ ✓  
CD 1 bay =  $40 - 0,012\text{m}$   
 $= 39,988\text{ m}$  ✓  
3 bays =  $39,988 \times 3$ ✓  
 $= 119,964\text{ m}$ ✓ (6)

[20]

**QUESTION 5**

- 5.1 C1-C2 =  $[(-75263,37 - -75243,16)^2 + (3649\,934,32 - 3650\,011,00)^2]$ ✓  
 $= [(-20,21)^2 + (-76,68)^2]$ ✓  
 $= 79,300\text{ m}$ ✓  
  
C1-C3 =  $[(-75292,89 - -75243,16)^2 + (3650010,66 - 3650011,00)^2]$ ✓  
 $= [(-49,73)^2 + (-0,34)^2]$ ✓  
 $= 49,73\text{ m}$ ✓  
  
C3-C4 =  $[(-75309,79 - -75292,89)^2 + (3649946,55 - 3650010,66)^2]$ ✓  
 $= [(-16,900)^2 + (-64,11)^2]$ ✓  
 $= 66,30\text{ m}$ ✓

$$\begin{aligned} C3-C7 &= [(-75316,13 - -75292,89)^2 + (3650016,75 - 3650010,66)^2] \checkmark \\ &= [(-23,24)^2 + (6,13)^2] \checkmark \\ &= 24,033 \text{ m} \checkmark \end{aligned}$$

$$\begin{aligned} C7-C6 &= [(-75333,84 - -75316,13)^2 + (3649966,33 - 3650016,79)^2] \checkmark \\ &= [(-17,71)^2 + (-50,46)^2] \checkmark \\ &= 53,477 \text{ m} \checkmark \end{aligned}$$

$$\begin{aligned} \text{TOTAL} &= 73,30 \checkmark + 49,73 \checkmark + 66,30 \checkmark + 24,033 \checkmark + 53,477 \\ &= 272,84 \text{ m} \checkmark \end{aligned}$$

(25)

5.2 Pegs, ranging rod, tape, hammer and lime

(5)

**[30]****QUESTION 6**

POINT	BACK SIGHT	INTER SIGHT	FORE SIGHT	RISE	FALL	REDUCED LEVEL	REMARKS
A	2,634					29,735	TBM 29,735
B	2,333		2,563	0,071✓		29,806✓	
C	2,375		1,530	0,803✓		30,609✓	
D		2,075		0,300✓		30,909✓	
E	2,335		1,450	0,625✓		31,534✓	
F			2,162	0,173✓		31,707✓	TBM 31,707
	9,677		7,705	1,972	0,000	31,707	
	7,705			0,000		29,735	
	1,972✓✓			1,972✓✓		1,972✓	

**[15]****TOTAL: 100**