higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE

AUGUST EXAMINATION

BUILDING AND STRUCTURAL SURVEYING N4

1 AUGUST 2014

This marking guideline consists of 7 pages.

DHET

7/8/14

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QUESTION 1

1.1 A map can be defined as the representation of outlines or features√ of a large area to a small scale.√

1.2 Are imaginery lines joining places√ on the earths surface where the declination of a given point is zero√

1.3 In plane surveying the curvature of the earth's surface√ is not taken into acccount.√

(3 × 2) **[6]**

QUESTION 2

2.1
- Before taking measurements the surveyor have to carefully examine the area√ to be surveyed.√
- This is done so that he can plan his work√ accordingly and decide which survey method√ he will employ. He will also select the stations√ he will use (5)

2.2
- In close surveying the surveyor works from a known point to another√ known point√ or from a particular point and back to that same point.
- In open surveying the surveyor works from a point to an unknown point.√ (3)

2.3 In close surveying the work can be checked for accuracy√ whereas in open surveying the work cannot be checked.√ (2)

[10]

QUESTION 3

3.1
- An expression of the scale is given graphically in the form of a divided scale line. √
- This is a straight line of given length equally divided into primary divisions. √
- Measurement is done by means of a divider. √ (3)

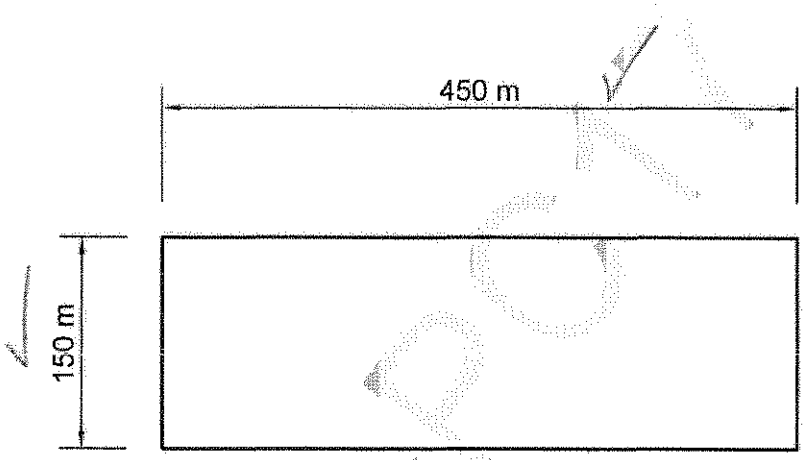
3.2 RF = 1 : 2 500
Map distance = 112 mm
Actual distance = 112 x 2500√
= 280 000 mm√
= 280 m√ (3)

3.3
	1 cm	=	2 km	
	1 cm	=	2 000 m	√
	10 mm	=	2 000 000 mm	√
RF	1	=	200 000	√

(3)

3.4

Area	=	L x B	
6, 75 ha	=	3B x B	√
6, 75 x 10 000	=	$3B^2$	
67 500	=	$3B^2$	
$\frac{67500}{3}$	=	B^2	√
22 500	=	B^2	
B	=	150 m	√
3B	=	450 m	√



(6)

3.5 S 60E E√√ (2)

3.6

360E	=	400^g	
X	=	336^g	√
X	=	$\frac{336x360}{400}$	√
	=	302 ° 24' 0 "	√

(3)
[20]

QUESTION 4

4.1
- Wrong readings√
- Wrong bookings √
- Measuring the slope of the ground instead of the slope of the tape.√
- Reading numbers inaccurately.√
- Not keeping the tape on the zero mark.√
- Booking wrong numbers as the correct number.√ (Any 5 x 1) (5)

4.2

$$CT = L\ x\ E\ x\ (Tm - Ts)\ \surd$$

$$+0{,}004 = 35{,}398\,x\ 0{,}0000113\ (30 - Ts)\ \surd$$

$$\frac{+0{,}004}{35{,}398\,x\,0{,}0000113} = 30 - Ts\ \surd$$

$$Ts = 30 - \left(\frac{0{,}004}{35{,}398\,x\,0{,}0000113}\right)\surd$$

= 20EC√ (5 × 1) (5)

4.3

$$Cct = \frac{w^2 l^3}{24t^2}$$

$$Cct = \frac{(0{,}015)^2 (37{,}5)^3}{24(7)^2}\ \surd$$

$$Cct = 0{,}01\ m\ \surd$$

Correct distance = 37,5 – 0, 01√

= 37, 49 m√ (4 x 1) (4)

4.4

$$Ch = \frac{LH}{R}$$

$$Ch = \frac{175\,x1500}{6373000}\surd$$

$$Ch = 0{,}041\ m\ \surd$$

Correct distance = 175 + 0, 041√

= 175, 041 m√ (4 x 1) (4)

[18]

QUESTION 5

5.1
- An electronic distance measuring instrument placed at one end of the line transmits electro-magnetic waves√ to a retro-reflector positioned at the other end of the line.√
- The retro-reflector returns the waves√ to the transmitter√, which then computes the slant length√ of the line and displayes it s a digital read-out.√

(6× 1) (6)

5.2
- Permanent shrinkage due to defects of material√
- Excessive amount of tension.√
- A short piece broken off √
- A short piece added on√
- Incorrect graduation during manufacturing.√
- An overlap or gap when attempting to repair the tape√ (Any five)
- A knot due to temporary repair √ (5 x1) (5)

[11]

QUESTION 6

6.1 6.1.1 PLanimeter√
Used to find the area of irregular figures.√

6.1.2 Change plate/Staff support√
Used to support the staff on soft ground.√

6.1.3 Staff bubble√
Used to keep the staff in a vertical position.√

6.1.4 Builders level√
Used to check/transfer levels or verticality over a short distance.√

6.1.5 Ranging rod/Spirit level √- No instrument/diagram given on Q.P.
- for aligning survey lines√
- for offset measurement √

PLEASE IGNORE THIS QUESTION (Paper out of 98)

(4× 2) (8)

6.2
- it should be sensitive√
- the magnetic axis should coincide with the geometrical axis.√
- the ends should lie in the same horizontal and vertical planes as the pivot point.√
- the centre of gravity should be as far below the pivot point as possible.√
- the housing box should be non-magnetic. √ (5 × 1) (5)

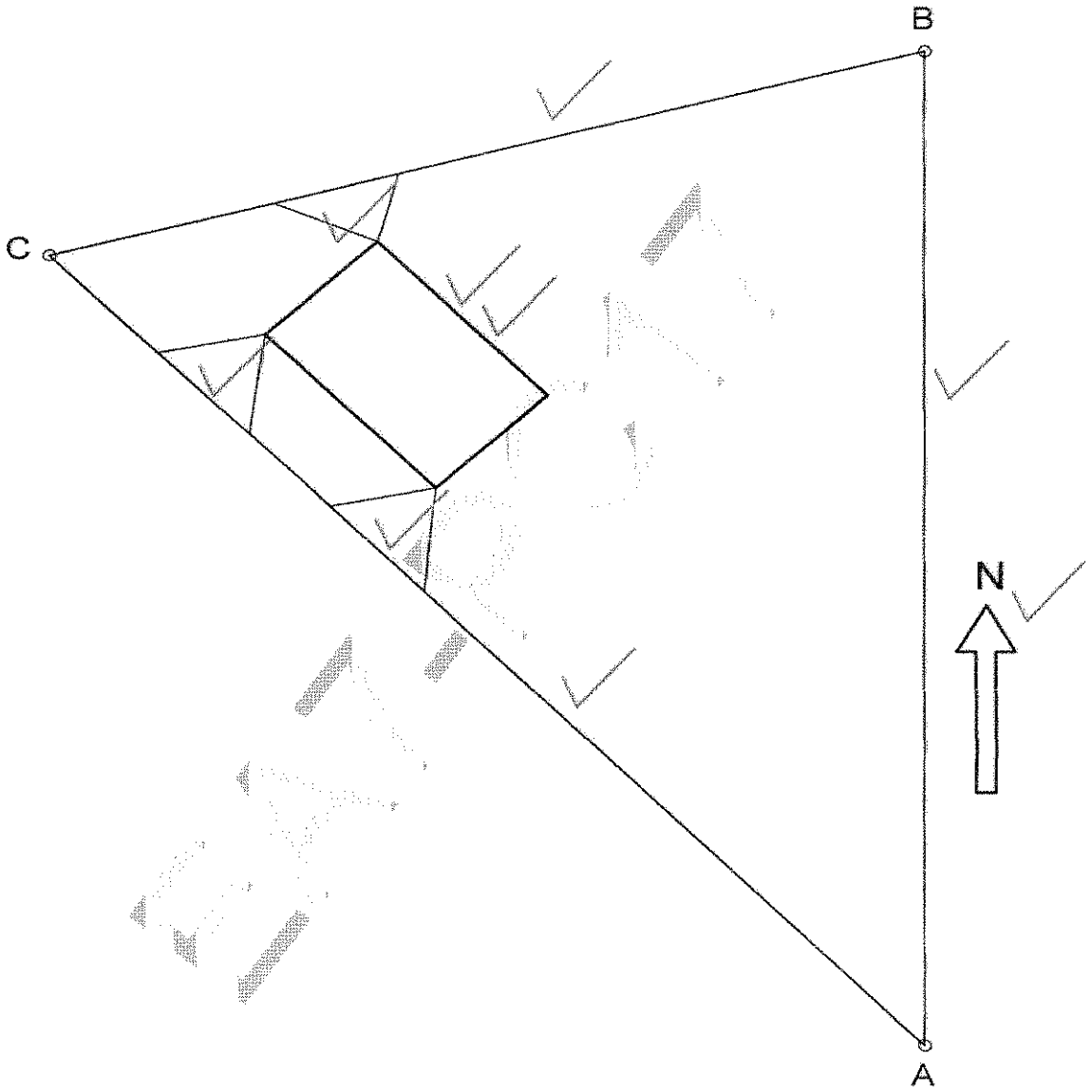
6.3 6.3.1 True√
6.3.2 False√
6.3.3 False√
6.3.4 False√
6.3.5 True√

(5 x 1) (5)
[20]

QUESTION 7

7.1
- Field notes are reduced to a minimum.√
- Since the area surveyed in view, gross mistakes are unlikely. √
- Tedious measurement of long distances are avoided.√
- The work is interesting and the surveyor sees the map growing.√
- The surveyor gets a thorough knowledge of the area.√
- Methods are fairly easily mastered.√
- Office work merely entail tidying up the plan.√ (Any 5 x 1) (5)

7.2



Correct plotting of AB	= 1
BC	= 1
CB	= 1
Correct ties	= 3x1
Building correct	= 2x1
North	= 1
Neatness	= 1
Total	**10**

(10)
[15]

TOTAL: 98