(5)

higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

T160**(E)**(J28)T
AUGUST 2010

NATIONAL CERTIFICATE

BUILDING AND STRUCTURAL SURVEYING N5

(8060045)

28 July (X-Paper)
09:00 – 12:00

NO programmable calculators are allowed.

This question paper consists of 4 pages and a 1-page formula sheet.

QUESTION 1

Indicate whether the following statements are TRUE or FALSE. Choose the answer and write only 'true' or 'false' next to the question number (1.1 – 1.5) in the ANSWER BOOK.

1.1 A trigonometrical beacon is normally situated at the top of a hill or a high structure where it can easily be seen. (2)

1.2 Co-ordinates of a point in surveying are written in brackets starting with the Y co-ordinate. (2)

1.3 The Pythagoras theorem does not apply in the join calculation. (2)

1.4 The optical square is set off a perpendicular from an existing straight line. (2)

1.5 Step chaining is mainly used during the construction of a staircase. (2)
[10]

QUESTION 2

2.1 Briefly explain the following terms:

2.1.1 Survey station (2)

2.1.2 Level line (2)

2.1.3 Geodetic survey (2)

2.1.4 Cadastral survey (2)

2.1.5 Contours (2)

2.2 Describe the uses of the following survey instruments:

2.2.1 Measuring tape (2)

2.2.2 Theodolite (2)

2.2.3 Levelling instrument (2)

2.2.4 Ranging rod (2)

2.2.5 Optical square (2)
[20]

QUESTION 3

A line A-D was measured in three sections:

A - B 90,288 m at a slope of 3°44'20"
B - C 72,408 m at a slope of 4°32'59"
C - D 47,652 m at a slope of 2°09'07"

Find the horizontal distance A to D. **[10]**

QUESTION 4

4.1 Explain, with the aid of a sketch, how to obtain a straight line between two points which are not within sight of each other. (10)

4.2 Explain, with the aid of a sketch, how to measure the distance if the chain is obstructed, for example by a building. (10)

4.3 Explain, with the aid of a sketch, how to measure across a river. (10)

4.4 State FIVE requirements to obtain sufficient accuracy when taping. (5)

4.5 Explain how the 3, 4, 5 method of setting a point is executed on a building. (5)
[40]

QUESTION 5

5.1 A square plot has an area of 16 m^2. If the land is to be represented on a plan of 1:150, find the length of a side in millimetres. (6)

5.2 State TWO characteristics of contours according to the slope of the terrain. (4)

5.3 A sloping rectangular site has out. As site surveyor you are required to put profiles for excavation so as to level the site. Explain how you would go about transferring your formation levels onto the profiles based on the length of your traveller. (10)
[20]

TOTAL: 100

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FORMULA SHEET

Any applicable formula may also be used.

$\Delta h = 50I \sin 2\theta + HI - MH = 100I \sin\theta \cos\theta + HI - MH$

or

$V = -KS\ Cos\theta\ Sin\theta$

$HD = 100I \cos^2\theta$ of $KS \cos\theta$

$Ct = L.e.(Tm - Ts)$; $Ct = L.e\ (Tm - Ts)$ of $L[1 + e\ (Tm - Ts)]$

$$C_T = \frac{W^2 . L^3}{24 . T^2} \text{ or } C_T = b\left[\frac{W^2\left(\frac{L}{b}\right)^3}{24T^2}\right]$$

$Cs = L.(1 - \cos\theta)$

$Cs = H(\sec\theta - 1)$

$$C_E = \frac{L . H}{R} \qquad CmsL = \frac{L . H}{R}$$

$$\text{Slope} = \frac{\Delta h}{HD}$$

$$V = \frac{d}{3}[(y_1 + y_n) + 2(y_3 + y_5 + \ldots + y_{n-2}) + 4(y_2 + y_4 + \ldots + y_{n-1})]$$