



TECHNICAL UNIVERSITY OF MOMBASA

SCHOOL OF ENGINEERING AND TECHNOLOGY
Department of BUILDING & Civil engineering
UNIVERSITY EXAMINATION FOR:

DIPLOMA IN CIVIL ENGINEERING
DCE 2206: SURVEYING II

END OF SEMESTER EXAMINATION
SERIES: AUG 2024
TIME: 2 HOURS

Instructions to Candidates

You should have the following for this examination

- Answer Booklet, examination pass and student ID
- non-programmable scientific calculator

This paper consists of **five** questions.
Attempt any **THREE** questions.

Do not write on the question paper.

QUESTION ONE (20 Marks)

The data shown in table 1 and fig. 1 is for a closed link traverse A,B,C,D, Given the coordinates of points A and B as A: 61.29m E, 211.80m N and, D: 323.39mE, 310.2mN . Compute the coordinates of points B, and C given the whole circle bearing of lines MN and PQ as $169^{\circ} 28' 29''$ and $25^{\circ} 12' 04''$ respectively, adjusting for any misclosure by the transit rule.

(20 Marks)

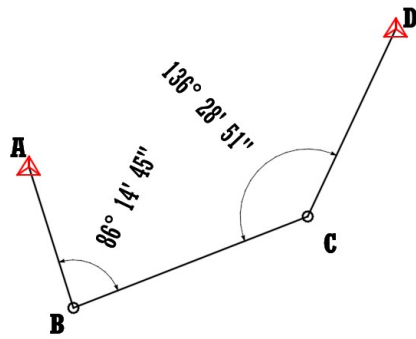


Fig 1

TABLE 1

Line (m)	length
	(m)
AB	106.25
BC	179.64
CD	149.73

QUESTION TWO (20 Marks)

- a) (i) State any FOUR points to be considered in the selection of stations in a theodolite traverse.
(ii) Differentiate between the terms open traverse and closed traverse

(8 Marks)

During a traverse survey one of the traverse legs was measured in catenary in one bay with a 100.00m steel tape standardized with a tension of 8.5Kg at 20°C and on the flat. After the survey the steel tape was compared with another linear measuring device known to be accurate and it was found to measure 199.983m only. Given the coefficient of thermal expansion of the tape material as 0.000011m per °C, and weigh 1.6Kg, using the information shown in table 2, calculate the corrected length of the line.

(12 Marks)

Table 2

bay	Measured length (m)	Day temperature °C	angle of slope	Field Tension (Kg)	Altitude (m)	tape Cross-sectional area (mm ²)
1	249.870	33	9° 30' 00"	9.20	600.00	1.25

QUESTION THREE (20 Marks)

The data shown in fig 2 and table 2 is for a closed loop polygonal traverse 1231. Given the coordinates of point '1' as 1: 168.44mE, 85.68mN and the whole circle bearing of line 12 as $45^{\circ} 00' 00''$, calculate the coordinates of points '2' and '3', adjusting for any misclosure by the Bowditch's method.

(20 Marks)

TABLE 1

Line (m)	Clockwise internal angles		
	0	/	//
12	60	05	03
23	67	02	50
31	52	52	04

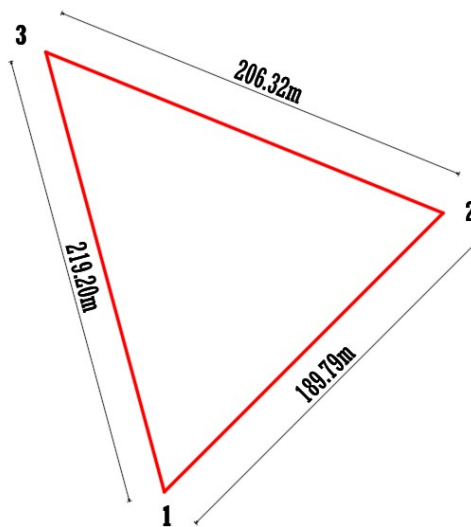


Fig 2

QUESTION FOUR (20 Marks)

A circular curve, 406.07m radius, is to be set out to connect two straights deflecting at an angle of 25° . Give the chainage of the intersection point as 2215.54m and that the curve is to be set out by the continuous chainage basis (through and through chainage), calculate the data for setting out the curve by the theodolite and tape method for 20m standard chords.

(20 Marks)

QUESTION FIVE (20 Marks)

A curve of 116.80m radius is to be set out to connect two straights as shown in fig 4.

As the intersection point is inaccessible and distance EF were measured and the length and angles are as figured.

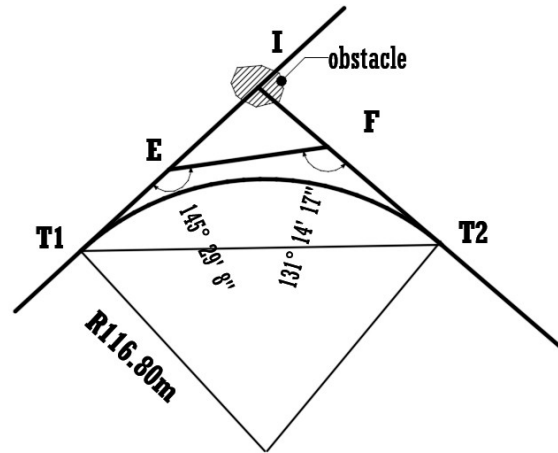


fig 4

Given that the chainage of the intersection point as 2000.47m and that the curve is to be set out by the through and through chainage basis. Calculate:

- (a) the deflection angle at I
- (b) the tangent distances $T1 E$ and $T2 F$
- (c) the length of the curve
- (d) the tangential angle required to set the curve at 20m sub-chords.

(20 Marks)