UNIVERSITY OF JOHANNESBURG

PROGRAM	:	**BACHELOR OF ENGINEERING TECHNOLOGY**
SUBJECT	:	**SURVEYING B1**
CODE	:	**SURCIB1**
DATE	:	SEMESTER-MAIN EXAMINATION November 2019 (SECOND SESSION)
DURATION	:	(Y-PAPER) 8:30-11:30
WEGHT	:	40:60
FULL MARKS	:	100
TOTAL MARKS	:	100

EXAMINER	:	MR. A. VESSAL	SAPSE NO
MODERATOR	:	MR. D. WILSON	FILE NO
NUMBER OF PAGES	:	5 PAGES	
INSTRUCTIONS	:	CALCULATORS ARE PERMITTED (ONLY ONE PER STUDENT)	

REQUIREMENTS	:	GRAPH PAPERS, RULER

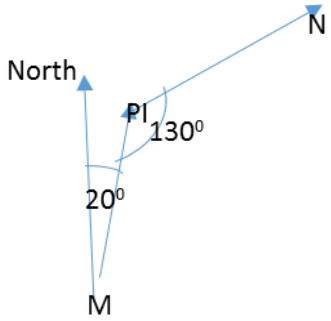
Surname and Initial …… Student # ……

INSTRUCTIONS TO STUDENTS:

1. ANSWER ALL QUESTIONS IN PEN NOT IN PENCIL
2. Show all your calculations to get a full mark
3. Return your test sheet with your answer sheet to the examiner

QUESTION 1

Triangulate PI intersection of Road M30 and M31 from Pegs M and N. (to check) (12)



	E	N
Coordinates of M	1200	2500
Coordinates of N	1030	2360

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QUESTION 2

We need to set up a Horizontal curve for the Question 1 .Determine the followings:
PI Chainage =1295.0m R(radius)=350m
1) Coordinates of a point on the curve with a chainage of 1300.00.(7)
2) Design this curve using the table to calculate all deflection angles, offset angles and chords for the 100 m chainage interval. (15)

Chord #	Chainage	Curve Length	Chord Length	Deflection angle ($\alpha = (90\times \ell / \pi/R)$)	Offset Angle	Offset Chord
PC						
1						
2						
3						
PT						

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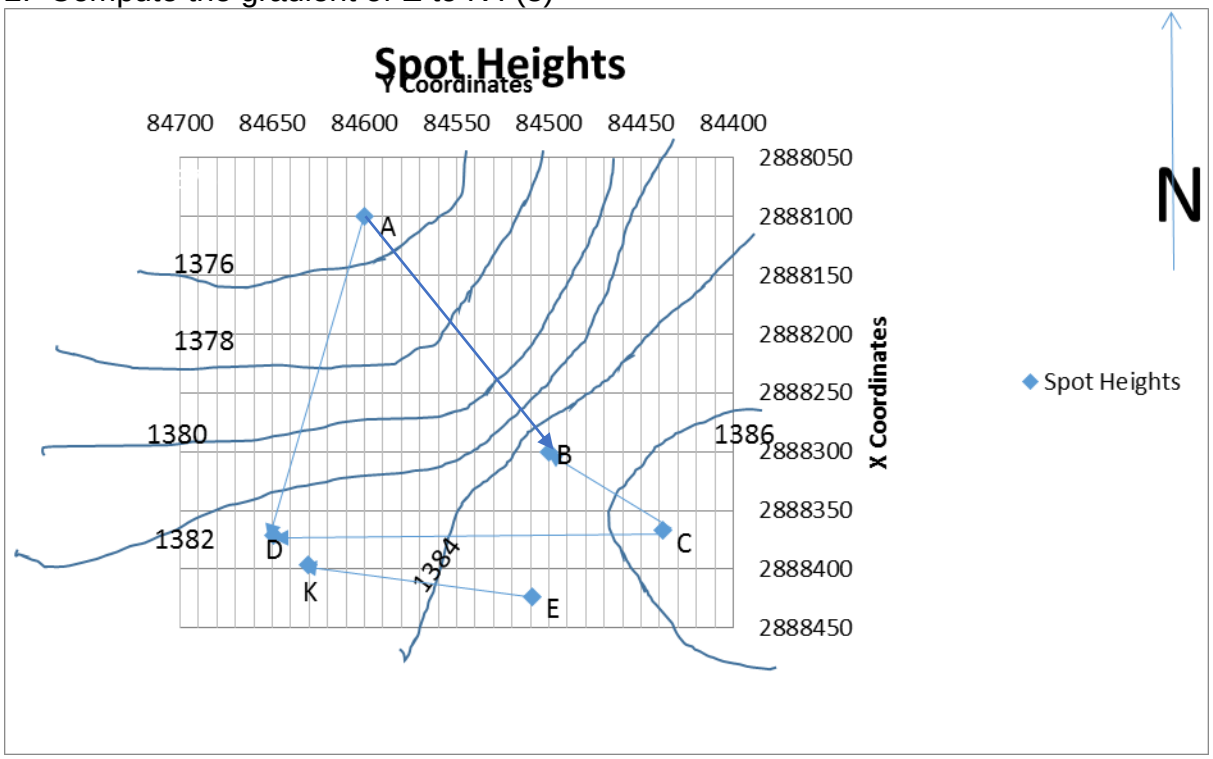
QUESTION 3

From the following figure) Do the following
1. Determine the area of ABCD using coordinates method.(10)
2. Compute the gradient of E to K . (8)



[18]

QUESTION 4

For the following information, compute the corrected coordinates of BCDE using Bowditch table (next page) and interior angles of the following closed traverse (ABCDEA).Draw the diagram of this traverse(6).

Line	Bearing	Distance
AB	156.6666667	110.01
BC	75.3	145.31
CD	351.1333333	98.75
DE	276.4833333	163.2
EA	187.45	52.34

		Departure(Δ E)	Latitude(Δ N)	Station	Y(Eastings)	X(Northings)
Bearing(WCB))	Distance, m	Bowditch	Bowditch		(E)	(N)
				A	1000.00	1000.00
				B		
				C		
				D		
				E		
				A		
				A	1000.00	1000.00
	Perimeter of Traverse= L=	∑Δ E=	∑Δ N=		Δ E=	Δ N=
		Error.e(Y)=	Error.e(X)=			
		Total Easting Correction (C_E)=	Total Northing Correction (C_N)=			
	Correction=					
	Check					

Table (14) angles (10) coordinates (12) diagram (6)

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Equations

L (curve length) = R× π× Δ /180

T = R tan (Δ/2)

External Distance = R (Sec Δ/2—1)

LC (Long Chord) or C = 2R sin (Δ/2)

M= R-R× cos Δ/2= R (1-cosΔ/2) Dc= (180×100)/ π/R=5729.578/R

α = (90/ π/R) ×ℓ for each (ℓ) Chord = 2R sin α for each (ℓ)

[TOTAL: 100]