

CONFIDENTIAL



UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
SEMESTER I
SESSION 2012/2013**

COURSE NAME : ENGINEERING GEOMATIC
COURSE CODE : BFC 20703/BFC 2103
PROGRAMME : 2 BFC
EXAMINATION DATE : JANUARY 2013
DURATION : 3 HOURS
INSTRUCTION : 1. **ANSWER FOUR (4)**
QUESTIONS ONLY.
2. ATTACH APPENDIX I AND II
WITH YOUR ANSWER
BOOKLET.

THIS QUESTION PAPER CONSISTS OF **EIGHT (8)** PAGES

CONFIDENTIAL

- Q1**
- (a) Define the terms of bearing and azimuth. Explain briefly, how it differs? (6 marks)
- (b) After testing the automatic leveling equipment using two peg test, one of the equipment had the collimation error. This error is constant with distance. Explain how to conduct the surveying work using this equipment without the influence of collimation error. (3 marks)
- (c) Explain in detail **FOUR (4)** field work procedures to control traverse during practical work for this course. (16 marks)
- Q2**
- (a) One of the levelling survey application in construction sector is for setting out the piling point. Using a proper diagram explain how this application is carried out. (4 marks)
- (b) Table 1 shows the levelling data for a tunnel. Determine the error limit and the reduced level of every point using height of collimation technique.

Table 1 : Levelling field work data

BS	IS	FS	Distance	Note
1.956				TBM 1 (24.464 m)
	-2.111			A
	-3.425			B
	-0.983			C
3.197		2.226	80	T.P 1
	-1.006			D
	-3.387			E
	-2.519			F
		1.382	70	TBM 5 (26.005 m)

(15 marks)

Note : Use Form Q2 to answer this question

- (c) What is the error in line of collimation for the level used in taking the following reading.

First Setup:

Rod reading at A, $a_1 = 1.075$ m
 Rod reading at B, $b_1 = 1.247$ m

Second Setup:

Rod reading at A, $a_2 = 1.783$ m
 Rod reading at B, $b_2 = 1.946$ m

(6 marks)

Q3 (a) Define the following terms with appropriate figures:

i. Close traverse, and

(3 marks)

ii. Open traverse

(3 marks)

(b) Table 2 shows the final bearing and distance from second class field work book.

Table 2 : Traverse bearing and distance

Station	Final Bearing	Final Distance (m)	Coordinates	
			South	West
1			1234.50	6789.00
2	063 30 00	63.264		
3	077 25 00	75.119		
4	173 43 30	82.147		
5	231 55 00	87.273		
1	322 19 00	114.829		

Note : Use Form **Q3** to answer this question.

Determine the following :

(i) Linear misclose,

(5 marks)

(ii) Latitude and departure correction using Bowditch method,

(5 marks)

(iii) Coordinate for every stations, and

(5 marks)

(iv) The traverse area using coordinate method

(4 marks)

Q4 (a) Briefly explain the tacheometry systems below:

(i) Optics tacheometry, and

(3 marks)

(ii) EDM tacheometry

(3 marks)

(b) Tacheometry survey using stadia technique was performed from station A. Table 3 shows all the observation data.

Table 3 : Techeometry data

Station : A
Instrument height : 1.510 meter
Station reduced level : 14.750 meter

Vertical Angle	Stadia			Notes
	Upper	Middle	Lower	
82° 23' 00"	1.466	1.400	1.334	B
94° 20' 00"	1.270	1.200	1.130	C

Based on this data, determine :

(i) Horizontal distance for each observation point when the constant values (K) = 100 and (c) = 0.

(4 marks)

(ii) Reduced level for every observation point.

(6 marks)

(c) Table 4 shows the data from tacheometry survey using total station.

Table 4 : Tacheometry observations data

Fr. Stn	To Stn	R.L. Stn	Ins. Height	Bearing	Horz. Dist.	Prism Height	Diff. Height	Notes
1	2	8.940	1.543	00° 00'				
				72° 05'	21.333	1.350	0.250	A
				102°00'	18.490	1.350	-0.347	B
				102°00'	28.897	1.350	0.634	C

Calculate :

(i) Reduced level for point A, B and C

(6 marks)

(ii) Horizontal distance for AC

(3 marks)

- Q5** (a) Table 5 shows the area of contour lines from 100m to 140m. Based on this value determine the volume using trapezium and Simpson method.

Table 5 : Contour line and area

Contour line (m)	Area (m ²)
100	3250
110	3101
120	2875
130	1337
140	571

(10 marks)

- (b) Figure Q5 shows all point observed using the levelling equipment with grid method. The reduced level values for each point are given in Table 6. Each point will be dug to same level of 10 m above datum. Determine the mean value and volume using both methods.

- (i) Triangle method, and

(5 marks)

- (ii) Square method

(5 marks)

Table 6 : Reduced level for each point

Point	Reduced level (m)
A	13.10
B	13.48
C	14.01
D	13.94
E	13.56
F	13.87
G	14.53
H	14.27

- (c) Define the algorithm to calculate the area for irregularly curved boundaries.

(5 marks)

- END of QUESTIONS -

FINAL EXAMINATION

SEMESTER/SESSION : SEM I/ 2012/2013
COURSE NAME : ENGINEERING GEOMATIC

PROGRAMME : 2 BFC
COURSE CODE : BFC 20703/BFC 2103

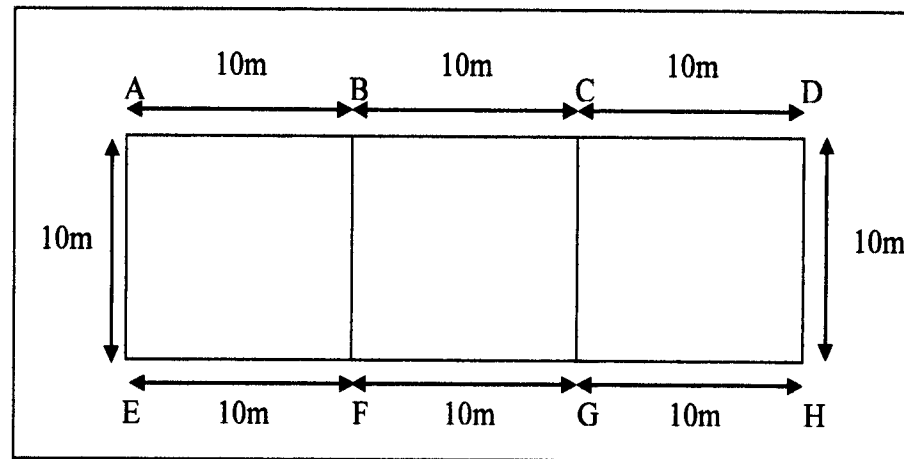


FIGURE Q5