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UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
SEMESTER I
SESSION 2013/2014**

COURSE NAME : ENGINEERING GEOMATIC
COURSE CODE : BFC 20703/BFC 2103
PROGRAMME : 2 BFF
EXAMINATION DATE : DECEMBER 2013/JANUARY 2014
DURATION : 3 HOURS
INSTRUCTION : ANSWER **FOUR (4)** QUESTIONS ONLY

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

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- Q1**
- (a) Scale is a distance ration on the map or plan compared to the distance on the ground. What is the scale if 1 mm distance on the map representation 0.5 ~~mm~~^m in true distance? Explain either the scale is a large or small scale. (5 marks)
 - (b) List **TWO (2)** the important characteristic of contour to produce accurate topographical plan and project planning. (5 marks)
 - (c) Simpson and trapezoidal are the method to calculate area. Differentiate both method and explain with suitable diagram. (5 marks)
 - (d) Before conducting a leveling work, the equipment must be checked to ensure it is in good conditions. Explain how carry out two peg test. Support your answer with calculations example. (10 marks)
- Q2**
- (a) Table 1 shows a data from leveling work. Based on the table, complete Table 2 with the leveling calculation and arithmetic check. The elevation of BM 055 is 54.604 m.. (15 marks)
 - (b) Calculate the gradient of point IL culvert 1 to IL culvert 5 (from Q2(a)). The given distance is 55.00 meter. (4 marks)
 - (c) Describe **THREE (3)** mistakes in leveling work and give the example how we can minimized the errors. (6 marks)
- Q3** An engineer measured distances and bearings of a closed traverse 1-2-3-4-1 as shown in Table 3. Complete Table 4 with the;
- i. Calculation of departures and latitudes. (5 marks)
 - ii. Calculation of departures and latitudes adjustment. (5 marks)

iii. Coordinates of station 2, station 3 and station 4. (5 marks)

iv. Calculate area bound by the closed traverse using two x latitudes x departures. (10 marks)

Q4 (a) Explain the concept of EDM tachometry using appropriate diagram. (6 marks)

(b) Discuss why tacheometry stadia is only suitable for less than 50 m observation (4 marks)

(c) Table 5 observations pertain to a tacheometry traverse conducted with constant 100 and additive constant 0.5m. Determine the distance of point A to point B and point B to point C, and reduced level of B and C. The given RL of A is 68.775m. (15 marks)

Q5 (a) The volume from spot heights is generally calculated using the grid elements as shown in Figure Q5. Find the volume within the grid as in the figure if the grid size is given as 12 m. *The base plane for the volume calculation is at reduced level of 10 m.* (15 marks)

(b) Describe the use of cut and fill in any construction work. Give appropriate examples with diagrams. (10 marks)

-END OF QUESTION-

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TABLE 1

BS	IS	FS	RL	Remarks
6.213			41.333 m	BM 042
4.105		0.891		TP 01
	3.903			IL culvert 1
	4.622			IL culvert 2
	6.330			IL culvert 3
	7.925			IL culvert 4
	8.322			IL culvert 5
7.397		1.128		TP 02
		2.425		BM 055

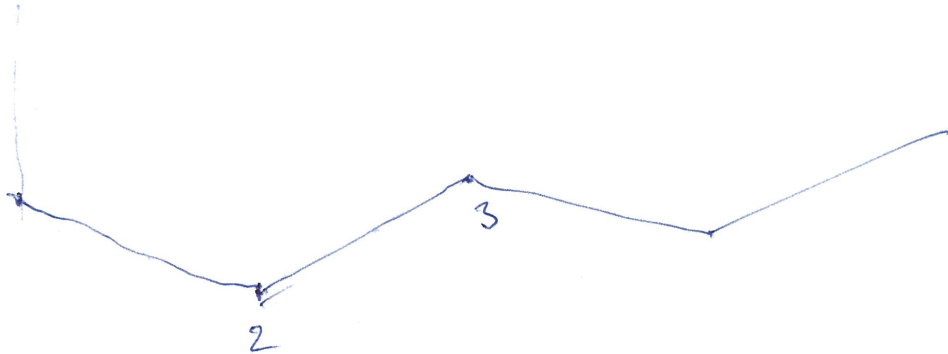
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TABLE 3

Traverse line		Bearing	Distance (m)	Adjusted Coordinates	
From	to			N/S	E/W
1				1500.000	2600.000
2	2	106.925136	35.256		
3	3	65.228940	34.387		
4	4	114.235890	31.398		
	1	73.054327	32.575	1500.000	2600.000



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TABLE 5

Point	To	Staff reading			Instrument Height	Vertical Angle
A	B	0.660	1.750	2.840	1.600	0° 00' 00"
B	A	0.715	1.810	2.905	1.560	0° 00' 00"
B	C	1.845	2.520	3.195	1.560	13° 56' 20"

	H ₁	H ₂	H ₃
	10.16	10.48	11.25
H ₄	10.56	10.87	11.53
H ₇	10.94	11.27	11.84

H₅

H₆

H₈

H₉

FIGURE Q5