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Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
SEMESTER II
SESSION 2018/2019**

COURSE NAME : ENGINEERING GEOMATIC
COURSE CODE : BFC20703
PROGRAMME CODE : BFF
EXAMINATION DATE : JUNE / JULY 2019
DURATION : 3 HOURS
INSTRUCTION : 1. ANSWER FIVE (5) QUESTIONS ONLY.
2. ATTACH APPENDIX 1 AND APPENDIX 2 WITH YOUR ANSWER BOOKLET.

THIS QUESTION PAPER CONSISTS OF EIGHT (8) PAGES

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- Q1**
- (a) Give the exact definition of Geomatics. Discuss briefly the **FIVE (5)** disciplines in Geomatics. (5 marks)
 - (b) Briefly describe the type of errors in linear measurement and explain their source of errors. What are the types of errors classified as blunders and mistakes in linear measurements? (5 marks)
 - (c) What is the significant difference between topographic survey and engineering survey in terms of their uses and scales. (5 marks)
 - (d) Briefly explain the differences between map and plan. (5 marks)

Q2 (a) In a two peg test of an automatic level, the following readings were taken:

- (i) Instrument at B, midway between A and C where $AB=BC$

Staff reading on A = 1.726

Staff reading on C = 1.262

- (ii) Instrument at D where $CD = AB/10$

Staff reading on A = 2.245

Staff reading on C = 1.745

Determine whether the instrument is in adjustment?

(5 marks)

- (b) The following consecutive readings in meter were taken with an automatic level:

(0.795, 1.855, 3.190, 3.015, 0.655, 0.625, 0.955, 0.255, 1.635, 0.860, 2.375).

The level was shifted (moved) after the fourth and eight readings. The first reading was taken on a benchmark whose Reduce Level (R.L) is 550.605 meters. Create a page of a level book and enter the readings. Calculate the reduced levels of the stations by the Rise and Fall Method and apply arithmetical checks. Note : Use **Appendix 1** to answer this question.

(15 marks)

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- Q3** (a) Briefly explain the definition of close and open traverse. (5 marks)
- (b) **Table Q3(b)** shows the final bearing and distance from second class traverse field work. Use **Appendix 2** to answer the followings.
- (i) Linear Misclosure (5 marks)
 - (ii) Latitude and Departure correction using Bowditch method (5 marks)
 - (iii) Coordinates for every stations (2 marks)
 - (iv) The traverse area using coordinate method (3 marks)
- Q4** (a) Tacheometry survey using stadia technique was performed from station O. the instrumentation height and reduced level are 1.500 m and 12.635 m respectively. **Table Q4(a)** shows all the observation data. Based on the 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)
- (b) **Table Q4(b)** shows the data from tacheometry survey using total station. Calculate;
- (i) Reduced level for points A, B and C (6 marks)
 - (ii) Horizontal distance of AC (4 marks)
- Q5** (a) Assume that the circular curve will be used at a PI where $I = 8^\circ 24'$. Assume that the station of the PI is $6 + 427.464$, and that terrain condition require a minimum radius of 900 m. Calculate the PC (T1) and PT (T2) stationing, and other defining elements of the curve. Also compute notes for staking the curve using 20 m increments. (10 marks)
- (b) **Figure Q5(b)** shows all points observed using the levelling equipment with grid method. The reduced level values for each point are given in **Table 5(b)**. Each point will be dug to same level of 10 m above datum. Determine the mean value and volume using Triangle and Square methods. (10 marks)

– END OF QUESTIONS –

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TABLE Q3(a)

Line	Definite Bearing	Definite Distance	Coordinates	
			North/South	East/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		

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NAME :
MATRIC NO. :
NAME OF LECTURER :
DESK NO. :

TABLE Q3(b)

Stn	Bearing	Distance	Latitute	Departure	Corrected		Coordinates	
					Latitute	Departure	N/S	E/W

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TABLE Q4(a)

Vertical Angle	Stadia			Notes
	Upper	Middle	Lower	
16° 20' 40"	2.12	1.435	0.75	To A
10° 32' 40"	3.05	1.837	0.625	To B

TABLE Q4(b)

From Stn.	To Stn.	Reduce Level Stn.	Instrument Height	Bearing	Horizontal Distance	Prism Height	Different 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

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TABLE Q5(b)

Points	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

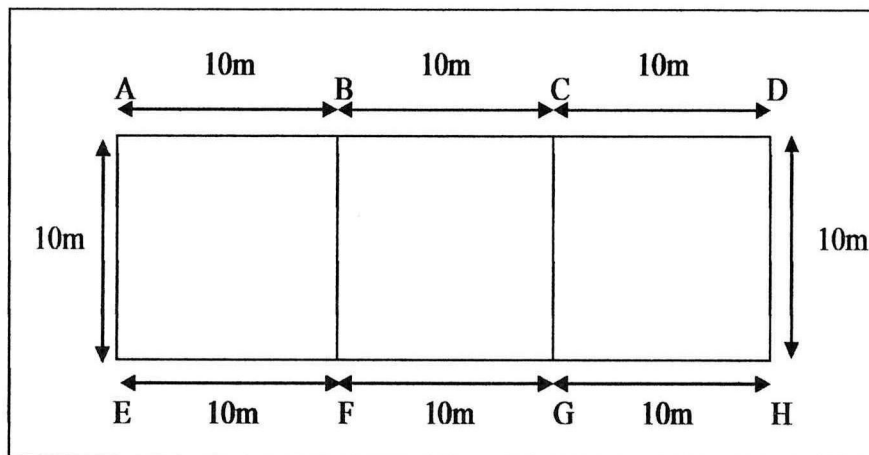


FIGURE Q5(b)