UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER I
SESSION 2011/12

COURSE NAME	:	ENGINEERING GEOMATIC
COURSE CODE	:	BFC 20703 / BFC2103
PROGRAMME	:	2 BFF
DATE	:	JANUARY 2012
DURATION	:	3 HOURS
INSTRUCTION	:	ANSWER **FOUR (4)** QUESTIONS ONLY

THIS PAPER CONSISTS OF **TWELVE (12)** PAGES

Q1 (a) Explain in detail the phrase below:

(i) Map
(ii) Plan
(iii) Engineering survey

(12 marks)

(b) (i) Convert the angular unit of 273° 35′ 19″ to decimal degrees.
(ii) Calculate what is the equivalent area on ground if the area on map is 13.4 cm^2 and the map scale is 1:50000.
(iii) If the slope distance from two points is 25.832 metre and the slope angle is 13° 30′ 00″, calculate the horizontal distance between this point.

(9 marks)

(c) Page checks (arithmetic checks) is the compulsory task at the every end of levelling work. Explain what is the purpose of this task.

(4 marks)

Q2 (a) List down THREE (3) criterias that need to be consider when selecting the place for horizontal control point.

(9 marks)

(b) Discuss why traverse survey must be start and end at the known point such as boundary mark.

(6 marks)

(c) (i) Coordinate for station 3 is (4793.261 N, 8594.526 E). If distance and bearing for station 4 from station 3 is 37.114 metre and 273° 35′ 19″, calculate the coordinate for station 4.

(5 marks)

(ii) If the reduce level for station 3 is 13.117 m and station 4 is 19.326 m, calculate the slope angle between this two stations.

(5 marks)

Q3 Figure **Q3** is the data from levelling work. Some of the values mark by (?) are missing. Calculate the missing values and use Figure **Q3** to answer this question.

(25 marks)

Q4 (a) Latitude and departure in **Table 1** is the bearing and distance adjustment from the second class traverse booking. From this data, calculate:

(i) Linear misclosure

(5 marks)

(ii) Latitude and departure correction using Bowditch method

(5 marks)

(iii) The traverse area using 2 x Latitude x Departure method

(5 marks)

Note : Use Figure **Q4(a)** to answer this question

(b) **Table 2** shows the booking form for traversing field work class II.

(i) State the value of *a, b, c, d, e, f, g, h, i* and *j*.

(5 marks)

(ii) Based on bearing from **Q4**b(i) and **Table 3**, calculate latitude and departure for each line.

(5 marks)

Q5 (a) Tacheometry survey using stadia technique was performed from station 5. **Table 4** shows all the observation data. From this data, calculate:

(i) Horizontal distance from station 5 to point A and B when the constant values (K) = 100 and (c) = 0

(5 marks)

(ii) Reduced level station 5 and point B

(5 marks)

(iii) Gradient AB

(5 marks)

(b) **Table 5** shows the data from tacheometry survey using total station instrument. If reduced level station 1 is 100.000 m, calculate :

(i) Reduced level point A and B

(4 marks)

(ii) Horizontal distance AB

(2 marks)

(c) Give the definition of phrases below
(i) Contour
(ii) Contour interval

(4 marks)

Q6 (a) **Table 6** shows the offset of an area beside the river with irregular boundary. Calculate the area with trapezium and simpson method if the interval of offset is 10 m.

(10 marks)

(b) Figure (6) shows all point observed using the levelling equipement with grid method. The reduced level values for each point are given in **Table 7**. Each point will be dug to the same level of 9 m above datum. Determine the mean value and volume using both methods.

(i) Triangle method

(5 marks)

(ii) Square method

(5 marks)

(c) State **TWO (2)** differences between Trapezium and Simpson rules to calculate the area with irregular boundary.

(5 marks)

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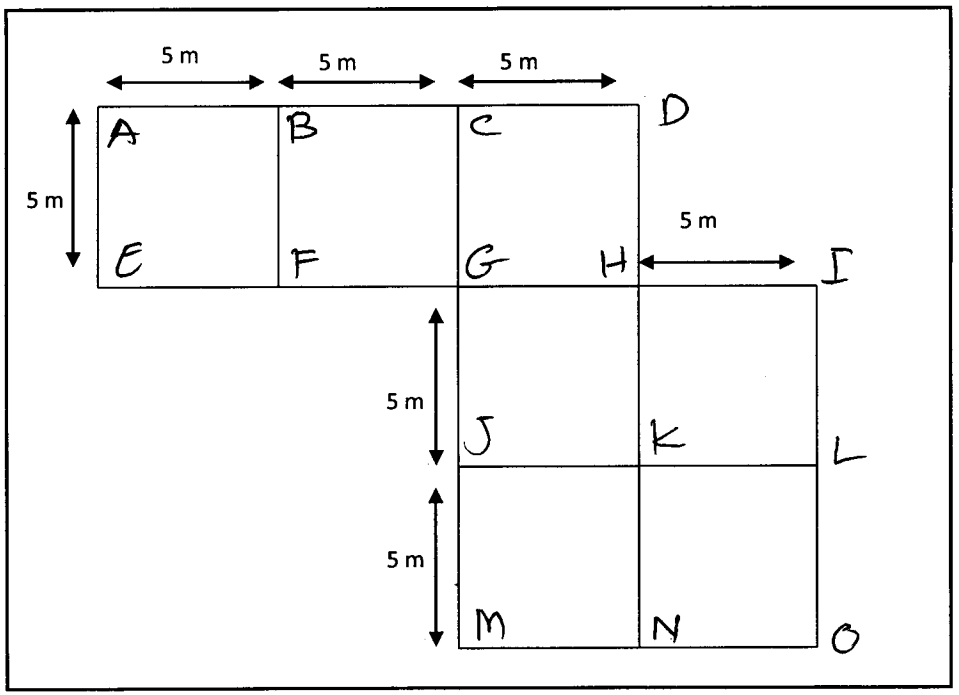

Figure **Q6**

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TABLE 7: 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
I	14.75
J	14.65
K	14.07
L	15.50
M	14.75
N	13.97
O	15.65

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Figure **Q3**

BS	IS	FS	HoC	RL	Adjustment	Adj. RL	Distance	Remarks
?			**16.461**	?		**15.115**		BM1 (15.115)
	2.467			?		?		1
	-1.116			?		?		2
	-2.165			?		?		3
	-1.978			?		?		4
	-2.229			?		?		5
	-1.001			?		**17.462**		6
1.579		3.999	?	?	?	?		CP1
?		?	**11.606**	**9.829**	?	?		CP2
	?			**13.835**	?	?		7
	?			**14.528**	?	?		8
	?			**12.943**	?	?		9
	?			**12.979**	?	?		10
	?			**7.788**	?	?		11
	?			**8.930**	?	?		12
?		2.897	**10.700**	?	?	?		CP3
?		2.893	**9.079**	?	?	?		CP4
		?		?	**-0.015**	?		BM2 (7.751)
7.965		15.314		7.766	7.766	**0.015/5**		
15.314				15.115	7.751	-0.003		
-7.349				**-7.349**	0.015			

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Figure **Q4**(a)

Stn	Latitude		Departure		Correction		Corrected		Area	
	(+)	(-)	(+)	(-)	Latitude	Departure	Latitude	Departure	2 x L	2 x L x D