UNIVERSITI SAINS MALAYSIA

First Semester Examination
Academic Session 2006/2007

October/November 2006

REG 231 – Basic of Land Survey
(Asas Ukur Tanah)

Duration: 3 hours
Masa: 3 jam

Please check that this examination paper consists of **SEVEN** pages of printed material before you begin the examination.

*Sila pastikan bahawa kertas peperiksaan ini mengandungi **TUJUH** muka surat yang tercetak sebelum anda memulakan peperiksaan ini.*

Students are allowed to answer all questions in English OR in Bahasa Malaysia.

Pelajar dibenarkan menjawab semua soalan dalam Bahasa Inggeris ATAU Bahasa Malaysia.

Answer **ALL** questions.

*Jawab **SEMUA** soalan.*

...2/-

1. (a) What are the advantages and disadvantages of plane table survey?

Apakah kelebihan dan kelemahan ukur meja satah.

(6 marks/*markah*)

(b) Radiation, intersection and traverse are 3 different methods of plane table survey used in measuring boundaries of site. Discuss these **Three (3)** methods.

Kaedah jejarian, silangan dan terabas merupakan 3 kaedah utama yang digunakan untuk mengukur sempadan sesuatu kawasan di dalam ukur meja satah. Bincangkan ***ketiga-tiga*** *kaedah ini.*

(8 marks/*markah*)

(c) The results of compass surveying on the plot of land is given in **Table 1**. Complete the tabulation and corrections needed for the final bearing of the plot.

Hasil pengukuran ukur kompas ke atas sempadan satu plot tanah diperolehi bearing-bearing seperti yang ditunjukkan di dalam ***Jadual 1****. Lakukan pelarasan yang diperlukan ke atas bearing cerapan dan dapatkan bearing akhir bagi sempadan tersebut.*

(11 marks/*markah*)

TABLE 1 ***(JADUAL 1)***

Boundary *(Garisan)*	Bearing *(Bearing Cerapan)*	Difference *(Beza)*	Correction to Local Attraction *(Pembetulan Tarikan Tempatan)*	Final Bearing *(Bearing Akhir)*	Final Difference *(Beza Akhir)*
A - B	60° 00'	180° 30'			
B - A	240° 30'				
B - C	130° 30'	179° 30'			
C - B	310° 00'				
C - D	178° 00'	181° 30'			
D - C	359° 30'				
D - E	230° 00'	181° 30'			
E - D	48° 30'				
E - A	330° 00'	180° 00'			
A - E	150° 00'				

2. (a) Describe on how you would conduct leveling survey on site to ascertain the height and the contour line of the ground surface.

Terangkan bagaimanakah anda menjalankan kerja ukur aras di tapak untuk mendapatkan ketinggian tanah dan kontur permukaan.

(10 marks/*markah*)

(b) Describe in detail the statements below:-
(Use sketches if needed).

Berikan penjelasan terperinci mengenai perkara berikut:-
(Gunakan lakaran jika perlu).

(i) Offset *(Ofset)*

(ii) Bearing *(Bearing)*

(iii) Local attraction *(Tarikan tempatan)*

(iv) Simpson and Trapezoidal Rule *(Kaedah Simpson dan Trapezoid)*

(v) Intermediate sight (Pandangan antara)

(15 marks/*markah*)

3. (a) Method of setting up leveling instrument will affect the readings obtained. Using sketches, explain how you would set up your dumpy level before taking appropriate readings.

Kaedah mendirisiapkan alat aras memberikan kesan pada bacaan ukur aras yang diperolehi. Dengan bantuan lakaran, terangkan bagaimana anda akan mendirisiapkan alat aras dompot sebelum memulakan pengukuran.

(5 marks/*markah*)

(b) **Table 2** shows the data collection from the field work site surveying. Using the rise and fall method, prepare leveling table and determine the level of stations, if datum level is 5.200m.

Jadual 2 *menunjukkan data yang diperolehi daripada pengukuran kerja lapangan. Dengan menggunakan kaedah naik turun, sediakan jadual ukur aras yang baru dan kirakan aras laras bagi setiap stesen, jika aras laras (datum) adalah 5.200m.*

(10 marks/*markah*)

TABLE 2 ***(JADUAL 2)***

PB (*BS*)	PA (*IS*)	PH (*FS*)	CATATAN (*REMARK*)
1.256			OFBM
	1.330		C
1.100		0.906	D
	1.332		E
	0.146		F
1.875		0.166	A
0.200		0.579	B
		2.780	OFBM

(c) **Table 3** shows the ground level booking through which a drain runs from MH 1 to MH 5. Calculate the reduced levels of each distance using height of point collimation method if the datum level at MH1 is 100m.

Jadual 3 *di bawah menunjukkan aras tanah di mana larian parit dari lurang 1 hingga lurang 5. Kirakan aras laras setiap jarak dengan menggunakan kaedah pengkolimatan jika datum pada manhole 1 adalah 100m.*

(10 marks/*markah*)

TABLE 3 ***(JADUAL 3)***

PB *(FS)*	**PA** *(IS)*	**PH** *(BS)*	**JARAK** *Distant*	**CATATAN** *Remark*
1.579			0.0	BM 1 on MH cover 1
	1.295		20.0	
	1.873		40.0	
	2.018		60.0	
	1.884		80.0	Manhole 2
	1.625		100.0	
2.441		1.000	105.0	Start of steps
	1.807		118.5	Top of steps
	1.495		122.3	Manhole 3
		1.020	135.0	BM 2 on MH cover 5

4. (a) Based on Simpson and Trapezoidal rules and **Table 4b**, determine the area of survey enclosed by the non linear boundary, the offsets and the linear boundary AC in **Figure 1**.

*Dengan menggunakan rumus Simpson dan Trapezoid dan berpandukan **Jadual 4b**, tentukan luas kawasan yang dibatasi oleh garisan tak sekata, ofset dan sempadan AC dalam **Rajah 1**.*

(10 marks/*markah*)

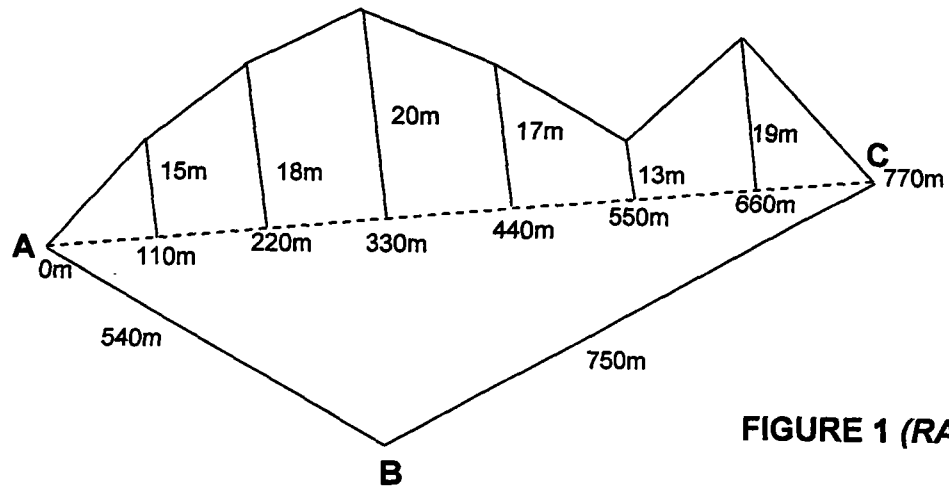

FIGURE 1 ***(RAJAH 1)***

TABLE 4(a) ***[JADUAL 4(a)]***

Distance of boundary of triangle ABC

Jarak sempadan segitiga ABC

Garisan Boundary	AB	BC	CA
Jarak (m) Distant (m)	540	750	770

TABLE 4(b) ***[JADUAL 4(b)]***

Offset reading from the measurement on boundary line AC.

Bacaan offset yang diukur pada jarak tertentu di atas garis sempadan AC

Chainage distant from A (m) [Jarak rantaian dari A (m)]	0	110	220	330	440	550	660	770
Offset (m) [Ofset (m)]	0	15	18	20	17	13	19	0

(b) A construction site, 80m x 120m has been identified for the construction of bungalow building. The spot height levels (in meter) were measured at the intersection of the grid lines of distant 40m each and the measured data are shown in **Figure 2**.

Determine the total volume of ground to be cut or filled of the platform level of the ground is fixed at 18.00m.

Sebuah tapak pembinaan seluas 80m x 120m telah dikenalpasti untuk dibina sebuah banglo. Titik-titik ketinggian di atas tanah telah diukur pada titik persilangan grid 40m dan data pengukuran adalah seperti di ***Rajah 2.***

Tentukan jumlah isipadu tanah yang perlu dipotong atau ditambak jika aras ketinggian tanah ditetapkan sebagai 18.00m.

1 – 17.06	2 – 17.48	3 – 17.63	4 – 17.37
5 – 17.70	6 – 17.96	7 – 17.58	8 – 18.01
9 – 18.25	10 – 17.83	11 – 18.19	12 – 18.42

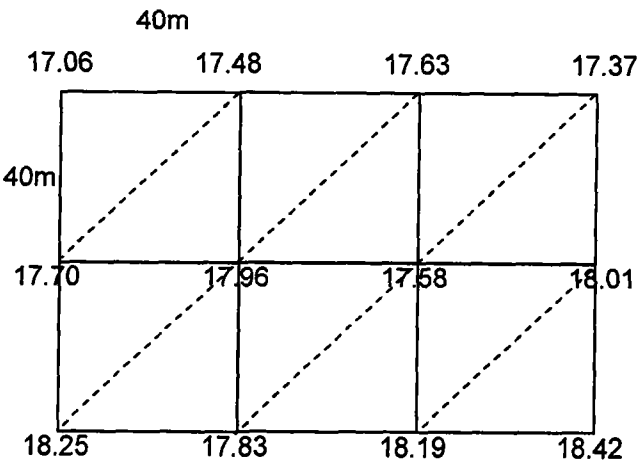

FIGURE 2 ***(RAJAH 2)***

(15 marks/*markah*)

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