UNIVERSITI SAINS MALAYSIA

1st. Semester Examination
Academic Session 2000/01

SEPTEMBER / OCTOBER 2000

EAA 231/3 – SURVEY ENGINEERING II

Time : [3 hours]

Instruction to candidates:-

1. This paper consists of **SIX (6)** questions. Assewer **FIVE (5)** questions only.

2. Answer both question from **Part A** and any **THREE (3)** question from **Part B**.

3. Answers **MUST BE** written in Bahasa Malaysia.

Part A. Answer all questions.

1.

a) The main component which are normally carried out in detail survey are planimetric control and vertical control.

Explained in detail these control surveys based on the 'Manual for detail survey and estimated survey cost for engineering work' published by Malaysian Public Works Department (JKR).

(10 marks)

b) The preparation of the design and layout plan of a Recreational Park in Tronoh, requires a 2nd Class survey to be carried out in the proposed area as shown in Figure 1. The project was awarded to Perunding Ukur KSN by the Majlis Daerah Perak Tengah to produced a detail plan and the topographic features of the area within one month. A survey plan featuring all the existing details of the area in digital format must be prepared at the scale of 1:1,000.

As an Engineer, you are required to prepare an estimated cost in supervising this project base on the following information:

Cost of survey team per day:	RM450.00
Preparation work:	1 survey team/day
Detail survey cost per hectare:	RM400.00
Distance of nearest bench mark:	2 km
Number of temporary bench mark required:	2

(10 marks)

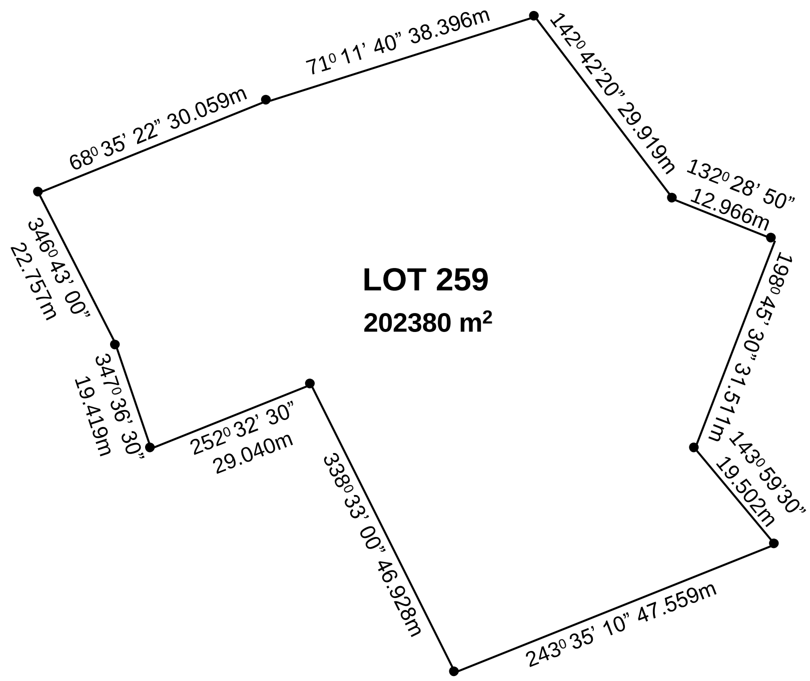

Figure 1

2 (a). An arc of radius 40 m has a tangent point to a line of bearing 75°30' at a coordinate of 4065.78 mN 2345.98 mE. The arc must be tangential to another line of bearing 167°52' .

(i) Calculate the coordinate of the other tangent point. (6 marks)

(ii) Calculate the length of the arc between the tangent points. (4 marks)

(b) Diagram 2 show the obstructions in the setting out curves. The line of sight has been obstructed by a building and the intersection point of the two straights falls on a steep hill.

Explain in detail the correct procedure of setting out curves that can be adopted in solving the various obstructions.

(10 marks)

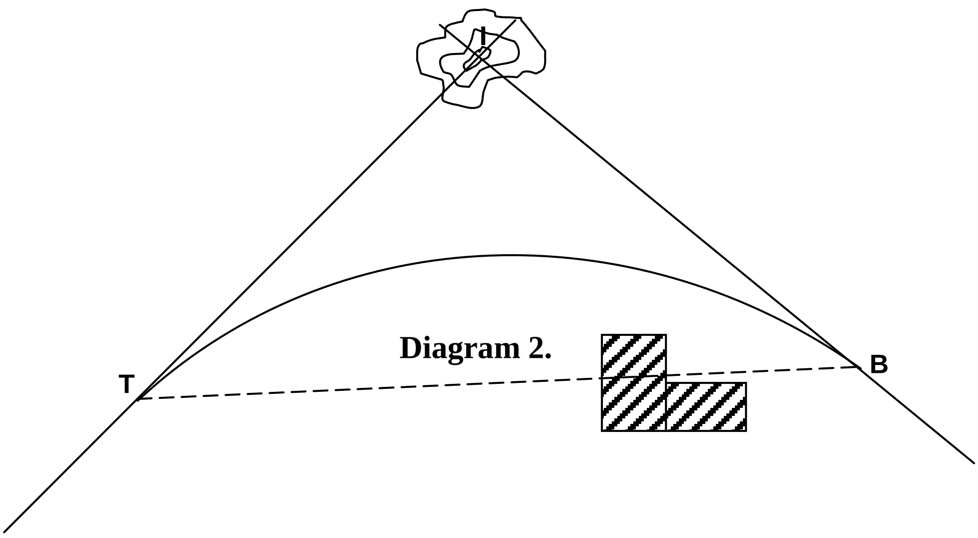

Diagram 2.

Part B. Answer any THREE (3) questions only.

3. (a) Explained the term "bench marking" based on the guide line given by the American National Benchmarking Standard for Automatic Data Input and Processing System, 1980.

(5 marks)

(b) With the aid of examples, explained in detail **TEN (10)** steps of benchmarking process that must be evaluate in the purchase of a new surveying software.

(10 marks)

(c) Describe the capability and the uses of the computational module of a good surveying software.

(5 marks)

4. (a) 'The insertion of a transition curve is to prevent the sudden lateral shock on passengers in a vehicle when traveling between a straight and the circular curve'.

With the aid of formulas and diagram, explained briefly the above statement with respect to the function of the transition curve..

(8 marks)

(b) Two straights that intersects at a deflection angle of $23^{\circ}\ 48'$, will be joined by a circular curve of radius 1000m and two transition curve having length of 100m at both ends.

Calculate the parameters and the setting out data of the followings:-

i. Tangent length; (2 marks)

ii. Deflection angles for the points on the first transition curve using 20m chord length, and

(8 marks)

iii. Length of circular curve. (2 marks)

5. (a) Discuss in detail the concept "from field to finish" in the contexts of contemporary survey practice.

(10 marks)

(b) Name the main component of total station equipment and describe **FIVE (5)** advantages and disadvantages of total station.

(10 marks)

6. (a) Describe in detail the procedure of monitoring survey in determining the vertical and horizontal control of a building structure during the construction process.

(10 marks)

(b) Figure 1 shows the booking levels for the setting out work on a drainage site. The horizontal distance of drainage line AE is 100.00m and is sloping from A to E at a ratio of 1:100.

Calculate the heights of the profiler at the points A, B, C, D and E if the length of the traveller is given as 2.5 m.

(10 marks)

Figure 1

Reduced Level (m)	Chainage (m)	Invert Level (m)	Remark
30.050	0	28.900	A
29.420	20		B
29.810	40		C
29.150	60		D
29.340	80		E

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