

**SULIT**



**BAHAGIAN PEPERIKSAAN DAN PENILAIAN  
JABATAN PENDIDIKAN POLITEKNIK  
KEMENTERIAN PENDIDIKAN TINGGI**

**JABATAN KEJURUTERAAN AWAM**

**PEPERIKSAAN AKHIR**

**SESI DISEMBER 2015**

**DCC3093: ENGINEERING SURVEY 2**

**TARIKH : 02 APRIL 2016**

**MASA : 11.15 AM - 1.15 PM (2 JAM)**

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Kertas ini mengandungi **SEPULUH (10)** halaman bercetak.

Bahagian A: Struktur (2 soalan)

Bahagian B: Struktur (4 soalan)

Dokumen sokongan yang disertakan : Kertas Graf

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**JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIARAHKAN**

(CLO yang tertera hanya sebagai rujukan)

**SULIT**

SECTION A: 50 MARKS

BAHAGIAN A: 50 MARKAH

INSTRUCTION:

This section consists of TWO (2) structured questions. Answer ALL questions.

ARAHAN:

Bahagian ini mengandungi DUA (2) soalan berstruktur. Jawab SEMUA soalan.

QUESTION 1

SOALAN 1

CLO1  
C2

(a) Identify the suitable term related to the circular curve of geometry as in Figure 1(a).

1(a).

Kenalpasti istilah-istilah yang bersesuaian dengan geometri lengkung bulat seperti dalam Rajah 1(a).

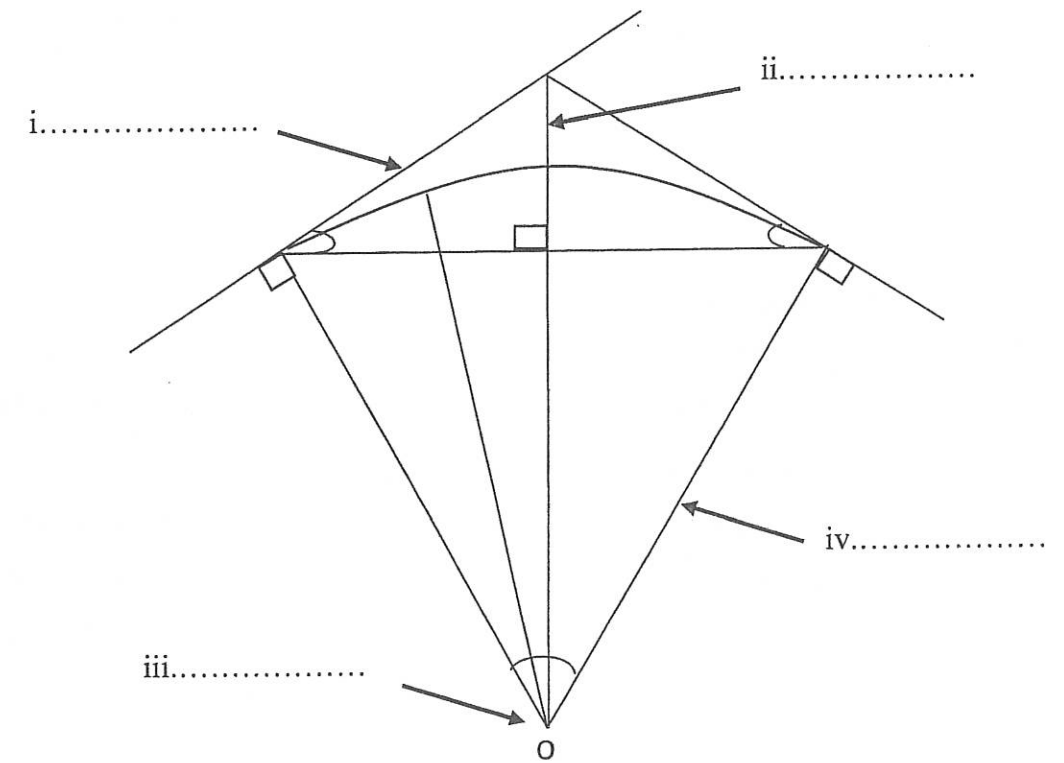


Figure 1(a)/Rajah 1(a)

[8marks]

[8 markah]

CLO1  
C3

(b) The centre-line of two straights is projected forward to meet at I, the deflection angle being  $40^\circ$ . If the straight lines are to be connected by a circular curve of radius 300 m, calculate all the setting out data, assuming 25 m chords on a through chainage basis, the chainage of I being 2350.35 m.

*Dua garis pusat lurus diunjurkan ke hadapan bertemu di I, sudut pesongan adalah  $40^\circ$ . Jika garis lurus hendak dihubungkan dengan lengkung bulat berjari 300 m, kirakan semua data penetapan keluar, dengan andaian perentas 25 m melalui rantaian asas, rantaian I menjadi 2350.35 m.*

[17 marks]  
[17 markah]

QUESTION 2

SOALAN 2

CLO1  
C2

a) Explain with sketch **FOUR (4)** equipments of setting out  
*Terangkan dengan lakaran EMPAT (4) peralatan memancang tanda*

[8 marks]  
[8 markah]

CLO1  
C3

b) Figure 2(b) below shows an underground drainage stop at point J and will be joined to point K with the gradient of 1:100 downward. Point J and K were marked with a wood picket on the ground. If the traveller height is 3.1 m and invert level at K is 95.458 m, calculate:

*Rajah 2(b) dibawah menunjukkan hujung saliran bawah tanah di titik J dan disambungkan ke titik K dengan kecerunan menurun 1:100. Titik J dan K yang ditanam dengan piket kayu di atas tanah. Jika ketinggian pengembara ialah 3.1 m dan aras dasar K ialah 95.458 m, kirakan:*

i) Reduce level of ground at J and K  
*Aras laras tanah di J dan K*

[4 marks]  
[4 markah]

ii) Reduce level of rail at J and K

*Aras laras rel di J dan K*

[4 marks]  
[4 markah]

iii) Depth of excavation at J and K

*Kedalaman korekan di J dan K*

[9 marks]  
[9 markah]

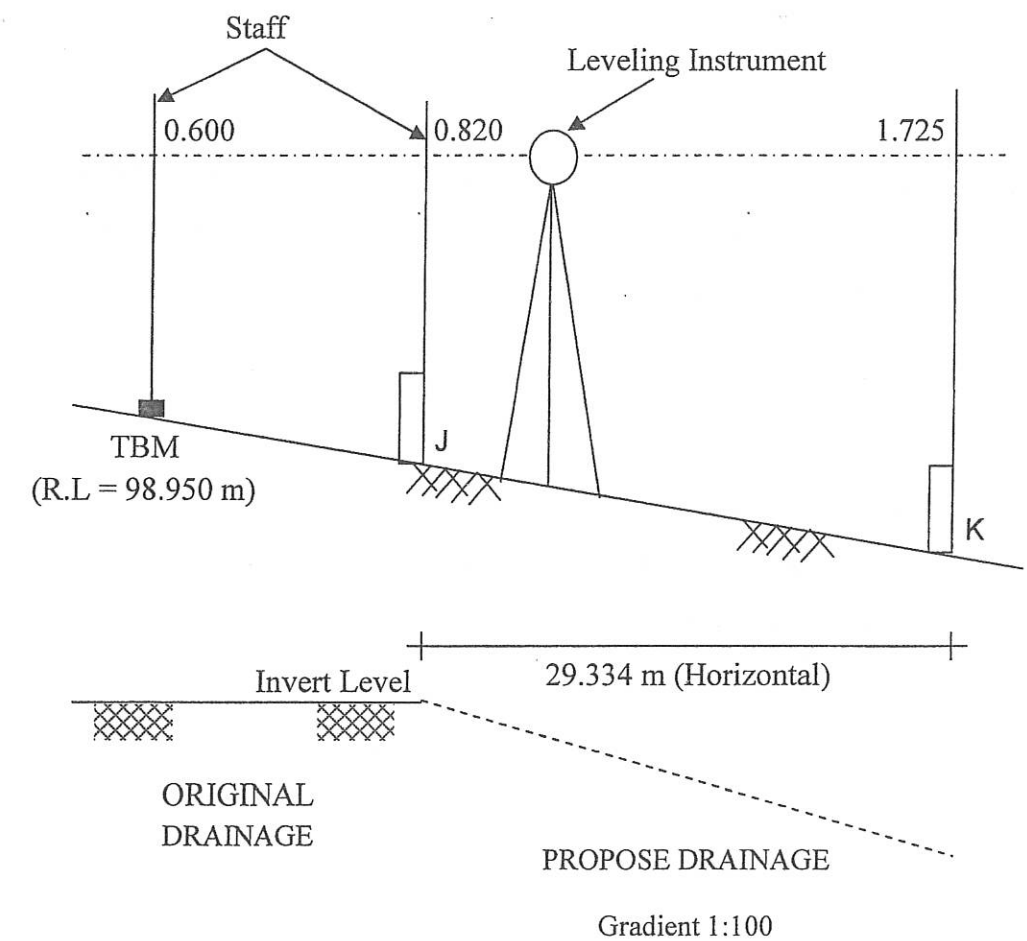


Figure 2(a)/Rajah 2(a)

## SECTION B: 50 MARKS

## BAHAGIAN B: 50 MARKAH

## INSTRUCTION:

This section consists of **FOUR (4)** structured questions. Answer **TWO (2)** questions only.

## ARAHAN:

Bahagian ini mengandungi **EMPAT (4)** soalan berstruktur. Jawab **DUA (2)** soalan sahaja.

## QUESTION 1

## SOALAN 1

- CLO1  
C1 (a) Describe briefly about EDM system between *Microwave* and *Electro Optical*.  
*Huraikan secara ringkas mengenai sistem EDM antara Gelombang Mikro dan Elektro Optik.*
- [5 marks]  
[5 markah]
- CLO1  
C2 (b) Explain **FIVE (5)** usages of EDM/Total Station in civil engineering work.  
*Terangkan LIMA (5) kegunaan EDM / Total Station dalam kerja-kerja kejuruteraan awam.*
- [10 marks]  
[10 markah]
- CLO1  
C3 (c) Interpret EDM/Total Station errors below;  
*Tafsirkan ralat-ralat EDM/Total Station di bawah;*
- i. Personal Error  
*Ralat Peribadi*
  - ii. Instrumental Error  
*Ralat Peralatan*

iii. Natural Error

*Ralat Semulajadi*

, [10 marks]

[10 markah]

## QUESTION 2

## SOALAN 2

- CLO1  
C1 (a) State **TWO (2)** types of method in area calculation with appropriate formula.  
*Nyatakan DUA (2) kaedah dalam pengiraan luas dengan rumus pengiraan yang terlibat.*
- [5 marks]  
[5 markah]
- CLO1  
C3 (b) The values of the  $y$  ordinates of a curve and their distance  $x$  from the origin are given in the **Table 2(b)** below. With the help of graphs, calculate the area under the curve by following methods;  
*Nilai-nilai ordinat lengkung  $y$  dan jarak  $x$  dari asalan diberikan dalam Jadual 2(b) di bawah. Dengan bantuan graf, kirakan keluasan kawasan di bawah lengkung menggunakan kaedah-kaedah berikut;*

Table 2(b)/Jadual 2(b)

|     |   |   |    |    |    |    |    |
|-----|---|---|----|----|----|----|----|
| $x$ | 0 | 1 | 2  | 3  | 4  | 5  | 6  |
| $y$ | 2 | 6 | 10 | 14 | 18 | 22 | 26 |

- i. Trapezoidal Rule  
*Kaedah Trapezoidal*
- ii. Simpson Rule  
*Kaedah Simpson*

iii. Mid Ordinate Rule  
Koordinat Pertengahan

[10 marks]  
[10 markah]

CLO1  
C3

(c) Table 2(c) shows the data cubic contents of an embankment of which the cross-sectional areas at 10 m intervals. Calculate the volume using :

Jadual 2(c) menunjukkan kandungan isipadu tambakan di mana keratan rentas kawasan adalah pada sela 10 m. Hitungkan isipadu menggunakan;

i. Prismoïdal Methods

Kaedah Prismoïdal

ii. End Areas Methods

Kaedah Keluasan Kawasan Hujung

Table 2(c)/Jadual 2(c)

|                            |    |    |    |    |     |     |     |
|----------------------------|----|----|----|----|-----|-----|-----|
| Distance (m)               | 0  | 10 | 20 | 30 | 40  | 50  | 60  |
| Jarak (m)                  |    |    |    |    |     |     |     |
| Area (m <sup>2</sup> )     | 12 | 45 | 65 | 70 | 155 | 175 | 210 |
| Keluasan (m <sup>2</sup> ) |    |    |    |    |     |     |     |

[10 marks]  
[10 markah]

QUESTION 3

SOALAN 3

CLO1  
C1

a) State **THREE (3)** uses of the Mass Haul Diagram (MHD).

Nyatakan **TIGA (3)** kegunaan gambarajah urungan padu (GUP).

[3 marks]

[3 markah]

CLO1  
C2

b) By referring to **Figure 3(b)**, identify the balance line, free haul distance, overhaul distance, free haul volume and overhaul volume. Calculate the overhaul dan freehaul

Berdasarkan **Rajah 3(b)**, kenal pasti garis seimbang, jarak angkut percuma, jarak angkut lebih, isi padu angkut percuma dan isipadu angkut lebih. Kirakan angkut lebih dan angkut percuma.

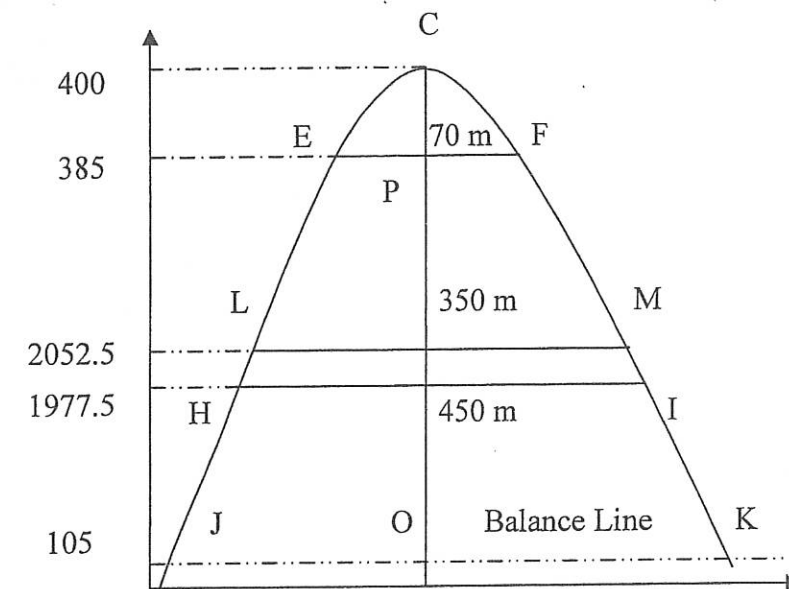


Figure 3(b)/Rajah 3(b)

[10 marks]

[10 markah]

CLO1  
C3

- c) Plot the Mass Haul Diagram graph using the horizontal scale of 1 cm = 50 m and the vertical scale of 1 cm = 10 000 m<sup>3</sup> according to the data in Table 3(c) below :

*Lukiskan graf gambarajah urungan padu dengan menggunakan skala mendatar 1 cm = 50 m dan skala menegak 1 cm = 10 000 m<sup>3</sup> berdasarkan data Jadual 3(c) dibawah :*

Table 3(c)/Jadual 3(c)

| Chainage (m) | Volume (m <sup>3</sup> ) |       |
|--------------|--------------------------|-------|
|              | Cut                      | Fill  |
| 0            | -                        | -     |
| 50           | -                        | 13000 |
| 100          | -                        | 22500 |
| 250          | -                        | 7500  |
| 300          | 5250                     | -     |
| 350          | 16375                    | -     |
| 400          | 22375                    | -     |
| 450          | 28500                    | -     |
| 500          | 34250                    | -     |
| 550          | 35750                    | -     |
| 600          | 33500                    | -     |

[12 marks]

[12 markah]

## QUESTION 4

## SOALAN 4

CLO1  
C1

A circular curve of 500 m radius is connected between two straight roads, which intersect with an angle of 14° 00' 20". During the design of the curve, the chainage of intersection point is 3500.00 m

*Satu lengkung bulat berjejari 500 m menyambungkan antara dua jalan yang lurus, bersilang dengan sudut 14 °00' 20". Semasa rekabentuk lengkung dilakukan, rantaian titik persilangan adalah pada 3500.00 m*

- a) Draw **THREE (3)** types of circular curve.

*Lukis TIGA (3) jenis lengkung bulat.*

[3 marks]

[3 markah]

CLO1  
C2

- b) With the aid of diagram, explain **FIVE (5)** terminologies used to describe a circular curve.

*Dengan bantuan gambarajah, terangkan LIMA (5) istilah yang digunakan untuk menggambarkan lengkung bulat.*

[10 marks]

[10 markah]

CLO1  
C3

- c) Calculate the data for setting out circular curve at 22 m interval.

*Kirakan data untuk penjajaran lengkung bulat pada sela 22 m.*

[12 marks]

[12 markah]

SOALAN TAMAT