

SULIT



BAHAGIAN PEPERIKSAAN DAN PENILAIAN  
JABATAN PENDIDIKAN POLITEKNIK  
KEMENTERIAN PENDIDIKAN TINGGI

JABATAN KEJURUTERAAN AWAM

PEPERIKSAAN AKHIR

SESI JUN 2015

**DCC 3093 : ENGINEERING SURVEY 2**

**TARIKH : 03 NOVEMBER 2015**

**TEMPOH : 8.30AM – 10.30AM (2 JAM)**

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Kertas ini mengandungi **DUA BELAS (12)** 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) Calculate the horizontal curve ranging data by using the tangent line offset method if the radius  $R$  is 500 meter, the deflection angle  $\theta$  is  $20^{\circ} 30' 00''$  and the intervals for ranging is 15 m each.

*Kirakan lengkung mendatar menggunakan kaedah offset dari garis tangen jika jejari,  $R$  ialah 500 m, sudut pesongan  $\theta$  ialah  $20^{\circ} 30' 00''$  dan menggunakan sela 15 m*

[8 marks]

[8 markah]

CLO1  
C3

- b) Two straight lines road with deflection angle  $\theta$  of  $30^{\circ} 00' 00''$  crossing at the point of crossing. One circular curve with radius of 450 meter needs to be constructed to join both roads. Using the long chord offset method and the intervals of ranging is 15 m, calculate the ranging data table.

*Dua garis lurus jalan dengan sudut pesongan  $\theta$ ,  $30^{\circ} 00' 00''$  merentasi satu titik. Satu lengkung mendatar dengan jejari 450 m hendak dilakukan untuk menghubungkan kedua-dua jalan tersebut. Dengan menggunakan kaedah offset dari perentas panjang dengan sela 15 m, kirakan data lengkung tersebut.*

[17 marks]

[17 markah]

## QUESTION 2

## SOALAN 2

CLO1  
C2

(a) Table 2(a) shows a leveling measurement data to design a sewer at Port Dickson Polytechnic.

Jadual 2(a) menunjukkan pengukuran data dari ukur aras untuk rekabentuk saliran di Politeknik Port Dickson.

Table 2(a)/Jadual 2(a)

| Backsight | Intermediate Sight | Foresight | Height Of Collimation | Reduce Level Point | Remarks          |
|-----------|--------------------|-----------|-----------------------|--------------------|------------------|
| 0.522     |                    |           | 50.522                | 50.000             | BM 1(RL=50.00)   |
|           | 1.120              |           |                       | A                  | A                |
|           | 2.835              |           |                       | B                  | A invert         |
|           | 1.215              |           |                       | C                  | B                |
|           | 2.605              |           |                       | D                  | B invert         |
|           | 1.334              |           |                       | E                  | C                |
|           | 1.905              |           |                       | F                  | C invert         |
| 2.134     |                    | 1.236     | H                     | G                  | D                |
|           |                    | 1.320     |                       | 50.100             | BM 2 (RL=50.100) |

- i. Identify value of blank column in the table (A to H).  
Kenalpasti nilai bagi ruangan kosong dalam jadual(A ke H)

[4 marks]

[4 markah]

- ii. Explain TWO(2) purposes of setting out.  
Terangkan DUA(2) tujuan pemancangan tanda.

[4 marks]

[4markah]

(b) A straight length of sewer is to be laid between three manholes A, B and C. Table 2(b) shows the data available :

Panjang lurus pembentung akan disambung di antara tiga lurang A,B dan C. Jadual 2(b) menunjukkan data berkenaan :

Table 2(b)/Jadual 2(b)

| BS    | IS    | FS    | HOC     | RL     | REMARKS         | DISTANCE |
|-------|-------|-------|---------|--------|-----------------|----------|
| 0.380 |       |       | 100.380 | 100.00 | RL TBM = 100.00 | 0        |
|       | 0.632 |       |         | 99.748 | A               | CH 20.00 |
|       | 0.721 |       |         | 99.659 | B               | CH45.00  |
|       |       | 0.987 |         | 99.393 | C               | CH75.00  |

Calculate :

Kirakan :

- i. The invert level of B and C, if invert level A = 95.000 m and reduced gradient = 1:110.  
Kirakan aras terbalik B dan C, jika nilai aras terbalik A = 95.00 m dan kecerunan menurun = 1:110.

[4 marks]

[4 markah]

- ii. The reduced levels of the sight rails at A, B and C if a 5.50 m traveler is to be used to locate the sewer invert.

Aras laras rel aras di A, B dan C jika rod pengembara yang digunakan bagi menentukan kedalaman pembentung ialah 5.50 m.

[5 marks]

[5 markah]

- iii. The height of sight rails above ground level at A, B and C

*Tinggi rel aras dari aras permukaan tanah di A, B dan C.*

[5 marks]

[5 markah]

- iv. The depth of excavation at A, B and C.

*Kedalaman galian di A, B dan C.*

[3 marks]

[3 markah]

**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**

- a) List down **FIVE (5)** uses of EDM in survey and civil work.

*Senaraikan LIMA (5) kegunaan EDM dalam kerja Ukur dan kejuruteraan awam.*

[5 marks]

[5 markah]

- b) Describe clearly about **THREE (3)** errors occurred on EDM instrument

*Terangkan dengan jelas mengenai TIGA (3) kesalahan yang berlaku pada alat EDM*

[10 marks]

[10 markah]

- c) The wave travel from station A to station B with a frequency of 5Hz and velocity of

3.0 m/s respectively. The counter showed that 10.5 number of waves detected approaching station B. Calculate the horizontal distance from A to B and sketch

diagram to explain measurement a principle of EDM instrument

*Satu gelombang bergerak dari stesen A ke stesen B dengan frekuensi 5Hz dan*

*halaju 3.0 m/s. Mesin Pembilang menunjukkan 10.5 nombor gelombang dikesan*

*bila mendekati stesen B. Kirakan jarak mendatar A ke B dan lakarkan gambarajah*

*untuk menerangkan prinsip pengukuran alat EDM.*

[10 marks]

[10 markah]

QUESTION 2

SOALAN 2

CLO1  
C1

a) Write the general formula for prismoidal method.

*Tuliskan formula am bagi kaedah prismoidal.*

[5 marks]

[5 markah]

CLO1  
C3

b) The following **Figure 2(b)** shows the reduced level of rectangular plot which is to be excavated to uniform depth 9 meters above datum. Calculate the average depth and volume of earth to be excavated

*Rajah 2(b) menunjukkan aras laras bagi setiap segiempat yang akan dikorek untuk mendapatkan ketinggian sekata 9 meter di atas datum. Kira aras purata dan ispadu yang akan dikorek*

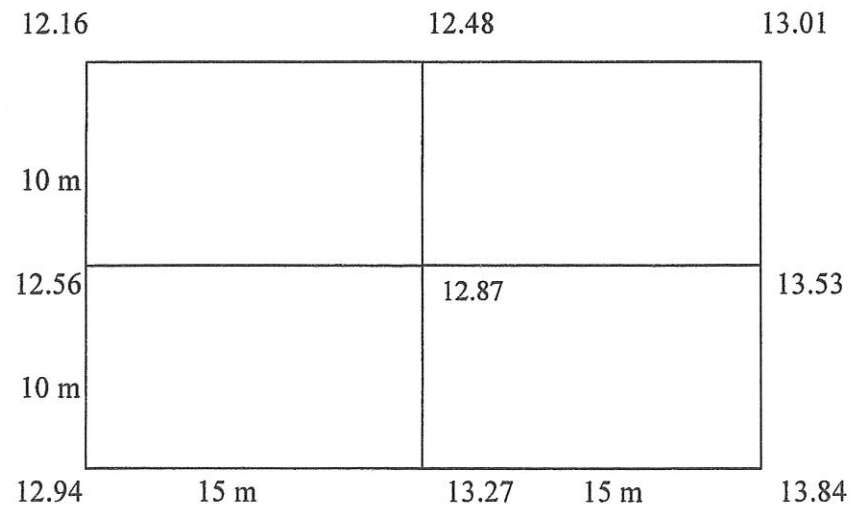


Figure 2(b) / Rajah 2(b)

[10 marks]

[10 markah]

Refer to Figure 2(c) and Table 2(c) for question (c)

*Soalan (c) rujuk Rajah 2(c) dan Jadual 2(c)*

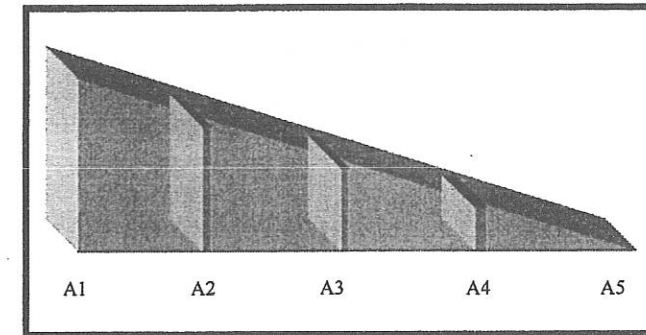


Figure 2(c) / Rajah 2(c)

Table 2(c) / Jadual 2(c)

| SECTION | AREA (m <sup>2</sup> ) | Distance (m) |
|---------|------------------------|--------------|
| A1      | 120                    | 0            |
| A2      | 100                    | 8            |
| A3      | 40                     | 16           |
| A4      | 25                     | 24           |
| A5      | 0                      | 32           |

CLO1  
C3

c) Calculate the volume using End Areas Method and Mid Areas Method

*Kirakan isipadu dengan menggunakan kaedah Hujung Luas dan kaedah Purata Luas*

[10 marks]

[10 markah]

QUESTION 3

SOALAN 3

CLO1  
C1

a) Define Mass Haul Diagram and Overhaul.

Takrifkan Gambarajah Urungan Padu dan Angkut Lebih.

[3 marks]

[3 markah]

CLO1  
C2

b) From Figure 3(b), identify the value of Free haul Volume, Overhaul Volume, Overhaul Distance, Borrow and Waste.

Dari Rajah 3(b), kenalpasti nilai bagi Isipadu Angkut Percuma, Isipadu Angkut Lebih, Jarak Angkut Lebih, Pinjaman dan Buangan.

[10 marks]

[10 markah]

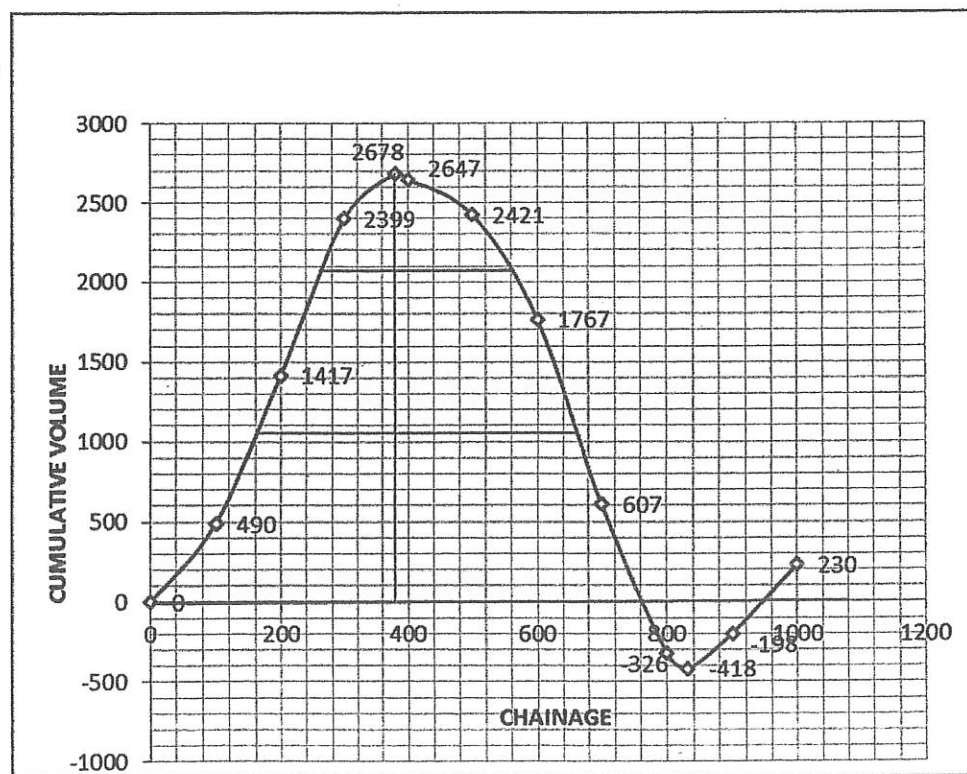


Figure 3(b)/Rajah 3(b)

CLO1  
C3

c) Given the following cut and fill volume in Table 3(c), complete the earthwork calculation using a shrinkage factor of 10%. Then draw the Mass Haul Diagram.

Jadual 3(c) adalah isipadu bagi keratan dan timbunan bagi satu kerja tanah, lengkapkan pengiraan kerja tanah tersebut dengan mengambil kira faktor pengecutan sebanyak 10%. Lukiskan Gambarajah Urungan.

[12 marks]

[12 markah]

Table 3(c)/Jadual 3(c)

| Chainage (m) | Volume of Cut (m <sup>3</sup> ) | Volume of Fill (m <sup>3</sup> ) |
|--------------|---------------------------------|----------------------------------|
| 0            | 1100                            |                                  |
| 50           | 1300                            |                                  |
| 100          | 1500                            |                                  |
| 150          | 1500                            |                                  |
| 200          | 350                             | 250                              |
| 250          |                                 | 1300                             |
| 300          |                                 | 1500                             |
| 350          |                                 | 1300                             |
| 400          |                                 | 1000                             |
| 450          | 300                             | 200                              |
| 500          | 1400                            |                                  |

## QUESTION 4

## SOALAN 4

CLO1  
C1

a) State the formula used for the following terms in Circular Curve:

*Nyatakan formula bagi terma berikut yang digunakan dalam Lengkungan Bulat:*

i. Tangent length , T

*Panjang garis tangen, T*

[1 mark]

[1 markah]

ii. Chainage of Beginning Curve

*Rantaian titik awal tangen*

[1 mark]

[1 markah]

iii. Length of Curve

*Panjang garis lengkung*

[1 mark]

[1 markah]

CLO1  
C2b) The two straight lines intersected at an angle of  $32^{\circ} 30'00''$  are connected by a circular curve with 500m radius. Given Chainage of Intersection Point is 1900.00m. Calculate :*Dua garis lurus yang bersilang pada sudut pesongan  $32^{\circ} 30'00''$  disambungkan oleh satu lengkung bulat berjari 500m. Diberi nilai Rantaian pada titik persilangan ialah 1900.00m. Kirakan:*

i. Tangent length , T .

*Panjang garis tangen, T.*

[3 marks]

[3 markah]

ii. Chainage of Beginning Curve

*Rantaian titik awal tangen, BC.*

[2 marks]

[2 markah]

iii. Length of Curve

*Panjang garis lengkung,  $L_c$ .*

[3 marks]

[3 markah]

iv. Chainage of End of Curve

*Rantaian titik akhir tangen, EC.*

[2 marks]

[2 markah]

CLO1  
C3c) Using data in **Question 4(b)**, prepare the suitable table setting out curve using the **Offset From Tangent** where the sub chord is 20 m interval. Draw a suitable sketch for this method.*Menggunakan data dalam Soalan 4(b), sediakan jadual pemancangan lengkungan yang sesuai menggunakan Kaedah Offset Dari Garisan Tangen, di mana sela sub perentas ialah 20 m. Lakarkan gambarajah yang sesuai berdasarkan jadual pemancangan menggunakan kaedah ini.*

[12 marks]

[12 markah]

SOALAN TAMAT