SULIT

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

PEPERIKSAAN AKHIR
SEMESTER II
SESI 2015/2016

NAMA KURSUS	:	KEJURUTERAAN GEOTEKNIK
KOD KURSUS	:	DAC 21103
KOD PROGRAM	:	DAA
TARIKH PEPERIKSAAN	:	JUN/JULAI 2016
JANGKA MASA	:	3 JAM
ARAHAN	:	JAWAB : **DUA (2)** SOALAN DALAM BAHAGIAN A DAN **DUA (2)** SOALAN DALAM BAHAGIAN B

KERTAS SOALAN INI MENGANDUNGI **DUA PULUH EMPAT (24)** MUKASURAT

SOALAN DALAM BAHASA MELAYU

BAHAGIAN A

S1 (a) Ujikaji pemadatan telah dijalankan ke atas contoh tanah dari projek pembinaan jalanraya. **Jadual 1** menunjukkan keputusan dari ujikaji tersebut.

(i) Lakarkan lengkuk pemadatan ketumpatan kering melawan kandungan lembapan.

(4 markah)

(ii) Berdasarkan lengkuk tersebut kenalpastikan yang berikut :
(i) Ketumpatan kering maksima dan kandungan lembapan optima
(ii) Had atas kandungan lembapan untuk pemadatan 95%
(iii) Had bawah kandungan lembapan untuk pemadatan 95%

(4 markah)

(iii) Kirakan peratus lompang-udara sifar pada ketumpatan kering maksima dan kandungan lembapan optima, A_v jika diberi graviti tentu untuk tanah ialah 2.68 dan ketumpatan air ialah 1 Mg/m^3.

(3 markah)

(b) Satu ujikaji ricih vane dijalankan ke atas contoh tanah liat dan dimensi alat serta kriteria tanah liat adalah seperti berikut : d=100mm, h=200mm, LL=85%, PL=28% dan *torque* = 120 N-m.

Kirakan yang berikut :

(i) Kekuatan ricih tak tersalir untuk tanah liat, s_{uv}.
(ii) Indeks keplastikan, PI
(iii) Faktor pembetulan μ
(iv) Kekuatan ricih tak tersalir yang diperbetulkan untuk tanah liat, $s_{uv(corr)}$.

(5 markah)

(c) Seorang penyelidik di RECESS UTHM mendapati tin pensampel seberat 23.48g. Jisim tin bersama tanah lembap didapati seberat 53.69g. Selepas dikeringkan selama 24 jam berat baru direkodkan sebagai 48.72g.

(3 markah)

(d) Satu ujikaji lengkap keatas contoh tanah liat berpasir mendapati data yang berikut : LL = 35% ; PL = 12%, kandungan liat = 16.4%, kelembapan semulajadi ialah 24%.

Kirakan yang berikut :

(i) Aktiviti tanah
(ii) Indeks kekonsistenan
(iii) Indeks kecairan

(6 markah)

S2 (a) **Rajah S2(a)** menunjukkan lengkuk bacaan dial gej melawan $\sqrt{t}$:

(i) Nilaikan t_{90} untuk contoh tanah yang diberi. Tunjukkan semua garisan pembinaan yang diperlukan.

(4 markah)

(ii) Kira nilai bagi pekali pengukuhan, c_v jika ketebalan purata diambil sebagai 30 mm. Gunakan nilai t_{90} dari S2(a)(i).

(2 markah)

(b) Satu contoh tanah diambil dari runtuhan cerun dibawa ke makaml dan dijalankan ujikaji ayakan ketas nya dan keputusan adalah seperti yang ditunjukkan dalam **Jadual 2**.

Nyatakan yang berikut :

(i) Lakarkan lengkuk taburan saiz zarah tanah

(4 markah)

(ii) Dari geraf; nilaikan yang berikut : D_{10}, D_{30} and D_{60}

(3 markah)

(iii) Kirakan C_u , C_c dan kelasifikasikan tanah tersebut

(4 markah)

(iv) Cadangkan kaedah penstabilan cerun yang sesuai dan berikan alasan anda.

(2 markah)

(c) Satu ujian pengepaman telah dijalankan di sebuah akuifer terkurung untuk menganggarkan nilai pekali ketelapan tanah di akuifer tersebut. Setelah aliran air mencapai keseimbangan, data berikut telah diperolehi :

1. Pengeluaran air seimbang dari telaga = 900 liter/min.
2. Aras air $h_1 = 4.5$ m dan $h_2 = 8$ m pada jarak $r_1 = 10$ m dan $r_2 = 75$ m.
3. Ketebalan akuifer = 10 m.
4. $q = 0.0125 m^3/s$

Air bumi asal adalah pada paras 2 m.

(i) Lakar dan labelkan permasalahan di atas secara tanpa skala

(3 markah)

(ii) Kirakan nilai k

(3 markah)

S3 (a) Keputusan satu ujikaji terkukuh tak tersalir (CU) pada kegagalan untuk tanah liat marin tepu di RECESS UTHM adalah seperti yang ditunjukkan dalam **Jadual 3(a) dan 3(b).**

(i) Kirakan semua nilai parameter CU untuk ujikaji tersebut.

(2 markah)

(ii) Bina bulatan Mohr untuk parameter jumlah keseluruhan, σ_3 and σ_1. Tunjukkan semua garisan pembinaan.

(2.5 markah)

(iii) Bina bulatan Mohr untuk parameter berkesan , σ'_3 and σ'_1. Tunjukkan semua garisan pembinaan.

(2.5 markah)

(iv) Nilaikan c dan ø.

(2 markah)

(v) Nilaikan c' dan ø'.

(2 markah)

(b) Sebuah asas pad dibina seperti **Rajah S3(b)(i),** menanggung beban sebanyak 1800 kN yang termasuk berat struktur, asas dan tanah timbun di atas asas. Jika dimensi penapaknya ialah 2.4m x 3.8m, nisbah lompang disitu, e_0 untuk lapisan liat boleh mampat sebagai 1.36. Index mampatan, C_c untuk lapisan liat ialah 0.69.

Nilaikan yang berikut :

(i) Tekanan tanggungan atas berkesan, p_0 (di tengah-tengah lapisan liat)

(2 markah)

(ii) Berat berkesan dari penggalian, W_e

(1 markah)

(iii) Tekanan pengukuhan net pada penapak asas, q_{net}

(1 markah)

(iv) Pengiraan pekali pengaruh tekanan m dan n:

(2 markah)

(v) Tekanan pengukuhan net di tengah-tengah lapisan liat dipusat asas, Δp

(2 markah)

(vi) Tekanan akhir ditengah-tengah lapisan liat, p

(1 markah)

(vii) Jumlah enapan pengukuhan primer, S
Dimana : C_c=0.69 (diberi); H=8m; e_0=1.36 (diberi)

(2 markah)

(c) Anggarkan kenaikan tegasan di garisn tengah 4 m di bawah sisi tapak selanjar. Jika berat tentu tanah ialah 18.6 kN/m^3, dibebankan oleh asas selanjar dengan kelebaran 2 m. Beban dinding ke atas asas ialah 325 kN/m untuk setiap panjang tembok.

(3 markah)

BAHAGIAN B

S4 (a) Lakarkan dan terangkan **tiga(3)** jenis kegagalan keupayaan galas*(types of bearing capacity failure).*

(5 markah)

(b) Diberi tapak bersaiz 1.5m x 1.5m diletakkan di bawah permukaan tanah sedalam 1.5m. Tapak ditindaki oleh beban sipi sebanyak 400 kN seperti dalam **RajahS4(b),S4(i)** dan **S4(ii)**. Sub-tanah mempunyai ketebalan endapan tanah berjelekit dengan qu = 160 kN/m^2 dan γ = 14.5 kN/m^3. Air bumi berada pada kedalaman yang baik dan kesannya terhadap keupayaan galas boleh diabaikan.

Analisiskan Faktor keselamatan (F.S) terhadap kegagalan keupayaan galas:

(i) Dengan menggunakan kaedah kelebaran berguna.
(ii) Menggunakan faktor pengurangan (Reduction Factor)

(10 markah)

(c) Satu tapak segiempat sama bersaiz 2.5m x 2.5m diletakkan 2m dibawah permukaan tanah. Aras air bumi adalah terletak 4 m dari permukaan bumi. Subtanah terdiri daripada endapan seragam yang lembut, tanah longgar. Keputusan ujkaji makmal adalah seperti dalam **Rajah S4(c)**. Rujuk **Rajah S4(ii)** untuk mendapatkan faktor keupayaan galas Terzaghi. Jika Faktor Keselamatan (FS) ialah 3.

Tentukan :
i) Keupayaan galas muktamat (q_{ult})
ii) Keupayaan galas yang dibenarkan (q_{all})
iii) Beban yang dibenarkan (Q_{all})

(10 markah)

S5 (a) Dengan bantuan gambarajah, Terangkan bagaimana ujian beban cerucuk dijalankan.

(5 markah)

(b) Diberi cerucuk konkrit telah dipacu ke dalam medium tumpat hingga pasir tumpat. Air bawah tanah terletak 3m di bawah permukaan tanah. Diameter cerucuk ialah 30 cm dan panjang cerucuk yang tertenam ialah 7 m. Keadaan tanah adalah seperti yang ditunjukkan dalam **Rajah S5(b).** Pekali tekanan sisi bumi (K) adalah 0.93 , tan δ adalah 0.45 dan faktor keselamatan ialah 2.0.

Analisiskan yang berikut:

(i) Kedalaman kritikal cerucuk dan lakaran tekanan menegak berkesan **(Pv)** lawan kedalam.
(ii) Beban cerucuk muktamad **($Q_{muktamad}$).**
(iii) Beban cerucuk rekabentuk **($Q_{rekabentuk}$).**

(10 markah)

(c) Diberi cerucuk konkrit berdiameter 0.45m cm dipacu kedalam tanah liat dekat tapak seperti **Rajah S5(c)i**. Rujuk **Rajah S5(c)ii** untuk mendapatkan nilai α. Dengan menggunakan faktor keselamatan 2.

Analisiskan :

i) Beban muktamad cerucuk ($Q_{Muktamad}$)
ii) Beban rekabentuk cerucuk ($Q_{Rekabentuk}$)

(10 markah)

S6 (a) Nyatakan nilai minimum faktor keselamatan sebenar yang sesuai bagi kestabilan tembok penahan.

(5 markah)

(b) Sebuah tembok penahan seperti **Rajah S6(b)**, bahan kambusbalik dari jenis 'coarse grain soil' mempunyai parameter seperti berikut;Berat tentu 18 kN/m^3 dan sudut Ǿ=38°. (coarse grain soil). Mempunyai beban teragih seragam sebanyak 10 kN/m^2 atas tanah timbus. Pekali geseran dasar tembok ialah 0.55. Keupayaan galas muktamad 730 kN/m^2 serta berat tentu konkrit 24 kN/m^3.

Dengan menggunakan kaedah Rankine selesaikan yang berikut:

(i) Tentukan tekanan aktif tanah terhadap tembok dan lokasi tekanan aktif paduan .
(ii) Nilaikan faktor keselamatan melawan gelangsaran.
(iii) Nilaikan faktor keselamatan melawan terbalikan.
(iv) Nilaikan faktor keselamatan melawan kegagalan tanah dasar.

(20 markah)

- SOALAN TAMAT -

QUESTION IN ENGLISH

PART A

Q1 *(a)* *A compaction test was conducted on a soil sample from road construction project.* ***Table 1*** *shows the result from the test.*

(i) *Sketch a compaction curve of dry density versus moisture content.*

(4 marks)

(ii) *Based on the curve identify the following :*

- *Maksimum dry density and optimum moisture content*
- *Upper limit moisture content for 95% compaction*
- *Lower limit moisture content for 95% compaction*

(4 marks)

(iii) *Calculate the percent zero air-void at maximum dry density and optimum water content, A_v. Given the specific gravity for the soil is 2.68 and water density is 1 Mg/m^3.*

(3 marks)

(b) *A vane shear test was conducted on a clay sample and the dimensions of equipment as well as the clay criteria is as follows : d=100mm, h=200mm, LL=85%, PL=28% dan torque = 120 N-m.*

Calculate the following :

(i) *Undrained shear strength, s_{uv} for the clay.*
(ii) *Plasticity index, PI*
(iii) *Correction factor μ*
(iv) *Corrected un-drained shear strength, for the clay, $s_{uv(corr)}$.*

(5 marks)

(c) *A researcher in RECESS UTHM obtain that a can sampler weighed 23.48g. The mass of can with the moist soil sample found to be 53.69g. After being dried for 24 hours, the new weight is recorded as 48.72g. Calculate the moisture content for the soil sample.*

(3 marks)

(d) *A complete laboratory test was conducted on a sample of sandy clay soil and the following data were collected : LL = 35% ; PL = 12%, clay content = 16.4%, natural moisture content is 24%.*

Calculate the following :

(i) *Soil activity*
(ii) *Consistency index*
(iii) *Liquidity index*

(6 marks)

Q2 *(a)* ***Figure Q2(a)*** *shows the curve of dial gauge reading versus* $\sqrt{t}$ *:*

(i) *Evaluate the value of* t_{90} *for the given soil sample. Show all necessary construction lines.*

(4 marks)

(ii) *Calculate the value of coefficient of consolidation,* c_v *if the average thickness of sample taken to be 30 mm. Use value of* t_{90} *from Q2(a)(i).*

(2 marks)

(b) *A soil sample from collapse slope were taken to laboratory and conducted a sieve test on them, the result is as shown in* ***Table 2****.*

Determine the following :

(i) *Sketch the soil particle size distribution curve*

(4 marks)

(ii) *From the graph; evaluate the following values :* D_{10}, D_{30} *and* D_{60}

(3 marks)

(iii) *Calculate* C_u , C_c *and classify the soil*

(4 marks)

(iv) *Recommend the type of slope stabilization method and state your reason.*

(2 marks)

(c) *A pumping test was conducted on a confined aquifer in estimating the coefficient of permeability of the soil. After it reaches the state of equilibrium, the following data were obtained :*

- *Discharge of water from tube well = 900 liter/min.*
- *Water level at* $h_1 = 4.5m$, $h_2 = 8m$ *at distance of* $r_1 = 10$ *m,* $r_2 = 75$ *m.*
- *Thickness of aquifer = 10 m*
- $q = 0.0125 m^3/s$
- *Original ground water level was at 2 m*

(i) *Sketch and label the unscaled figure of the problem*

(3 marks)

(ii) *Calculate the value of k*

(3 marks)

Q3 *(a) Results of consolidated undrained (CU) at failure for saturated marine clay at RECESS in UTHM is as shown in* ***Table 3(a) and (b).***

(i) Calculate all the CU parameters for the test.

(2 marks)

(ii) Construct Mohr's circle for the total parameter, σ_3 and σ_1. Show all necessary construction lines.

(2.5 marks)

(iii) Construct Mohr's circle for the effective parameter, σ'_3 and σ'_1. Show all necessary construction lines.

(2.5 marks)

(iv) Evaluate the values for c and ø.

(2 marks)

(v) Evaluate the values for c' and ø'.

(2 marks)

(b) A pad foundation constructed as shown in ***Figure Q3(b)(i)****, sustain a load of 1800 kN including structure weight, footing pedestal and backfill on the footing. If the dimension of the pad is 2.4m x 3.8m, insitu void ratio, e_0 is 1.36 and compression index, C_c for the clay layer is 0.69.*

Evaluate the following :

(i) Overburden pressure, p_0 (at middle of clay layer)

(2 marks)

(ii) Effective weight from excavation, W_e

(1 mark)

(iii) Net consolidation pressure on footing base, q_{net}

(1 mark)

(iv) Calculation of influence factor of m and n

(2 marks)

(v) Net consolidation pressure due to load at the mid-height of clay layer at center of footing, Δp

(2 marks)

(vi) Final pressure at the mid-height of clay layer, p

(1 mark)

(vii) Total primary consolidation settlement, S
Where : C_c=0.69 (given); H=8m; e_0=1.36 (given)

(2 marks)

(c) Estimate the value of stress increase at centerline 4 m below the edge of the strip footing. If soil with unit weight of 18.6 kN/m^3, loaded on the surface by a footing of 2 m wide. The load of the wall footing is 325 kN/m of wall length.

(3 marks)

PART B

Q4 *(a)* *Sketch and explain* ***three (3)*** *failures of the bearing capacity.*

(5 marks)

(b) *Given a 1.5mx 1.5m footing is located 1.5 m below the ground surface. The footing is subjected to an eccentric load of 400 kN as shown in* ***Figure Q4 (b)***, ***S4(i)****and* ***S4(ii)****. Sub-soil soil consists of a thick deposit of cohesive soil with qu = 160 kN/m^2 and γ = 14.5 kN/m^3. Water table is at a great depth, and its effect on bearing capacity can be ignored.*

Analyze safety factor (F.S) against bearing capacity failure:

(i) Based on the concept of useful width.

(ii) Using reduction factor

(10 marks)

(c) *A square footing with a size 2.5mx 2.5m is located 2m below ground surface. The water table is located 4 m from the ground. Subsoil consists of a uniform deposit of soft, loose soil. The laboratory test results are shown in* ***Figure Q4(c)****. Refer* ***Figure Q4(ii)*** *to obtain Terzaghi bearing capacity factor. If the Factor of Safety (FS) is 3.*

Determine:

i) Ultimate bearing capacity (q_{ult})

ii) Allowble bearing capacity (q_{all})

iii) Allowble load(Q_{all})

(10 marks)

Q5 *(a) With the aid of a diagram, explain how the pile load tests method is conducted.*

(5 marks)

(b) Given concrete piles were driven into the medium dense to dense sand. Groundwater is located 3m below ground. Pile diameter is 30 cm and the length of pile embedded is 7 m depth. Soil conditions are shown in ***Figure Q5(b)*** *and* ***Q5(b)i****. coefficient of lateral earth pressure (K) is 0.93, tan δ is 0:45 and the safety factor is 2.0*

Analyze the following:

(i) The critical depth (D_c) of the pile and sketches effective vertical pressure (Pv) verses Depth.
(ii) The ultimate pile load ($Q_{ultimate}$).
(iii) The pile design load (Q_{design}).

(10 marks)

(c) Given concrete piles 0.45m diameter were driven into the clay at site as shown in ***Figure Q5 (c)i****. Refer* ***Figure Q5 (c)ii*** *to obtain the α. Using a safety factor of 2.*

Analyze the following:
(i) The ultimate pile load ($Q_{ultimate}$).
(ii) The pile design load (Q_{design}).

(10 marks)

Q6 *(a) Explain a minimum safety factor suitable for the stability of the retaining wall.*

(5 marks)

(b) A retaining wall as shown in ***Figure Q6 (b)****, the material backfill from 'coarse grain soil' type has the following parameters: unit weight of 18kN/m^3 and friction angle Ǿ = 38 °. (Coarse grain soil). Have a uniformly distributed load of 10kN/m^2 on backfill surface. Coefficient of Bottom wall friction (μ) is 0.55. Ultimate Bearing capacity is 730kN/m^2 and the unit weight of concrete 24kN/m^3. By using the Rankine Method:*

Evaluate:

(i) Soil active pressure on the wall and location of the resultant active pressure.
(ii) The safety factor of sliding.
(iii) The safety factor of overturning.
(iv) The safety factor of bearing capacity failure.

(20 marks)

-END OF QUESTIONS –

FINAL EXAMINATION

SEMESTER / SESSION : SEM 2 / 2015/2016 PROGRAMME : 2 DAA
COURSES : GEOTECHNIC ENGINEERING COURSES CODE : DAC 21103

FORMULAE FOR PART A :

Q1 : $\rho_d = \frac{G_s \rho_w}{1+wG_s}(1-A_v)$; $c = \frac{T}{\pi\left[\left(\frac{d^2 h}{2}\right)+\left(\frac{d^3}{6}\right)\right]}$; PI = LL – PL ; $c_{corr} = \mu c$; $w = \frac{M_w}{M_s}$;

$A = \frac{PI}{\%\ clay\ particle\ (<2\mu m)}$; $I_c = \frac{LL-w}{I_p}$; $I_L = \frac{w-PL}{I_P}$

Q2 : $c_v = \frac{0.848 H_{t(av)}^2}{4t_{90}}$; $C_u = \frac{D_{60}}{D_{10}}$; $C_c = \frac{(D_{30})^2}{(D_{60})(D_{10})}$; $k = \frac{q \ln\left(\frac{r_2}{r_1}\right)}{2\pi H(h_2 - h_1)}$;

Q3 : $p_0 = \gamma' z$; $W_e = \gamma' z$; $q_{net} = \frac{P}{AXB} - W_e$; $\Delta p = 4(I_p)(w)$; p = p0 + Δp ;

$S = C_c\left(\frac{H}{1+e_0}\right)\log\frac{p}{p_0}$

FORMULAE FOR PART B :

1. $q_{ult} = 1.2cN_c + \gamma_1 D_f N_q + 0.4\gamma_2 BN_\gamma$ *(for square footing)*
2. $\emptyset' = tan^{-1}\left(\frac{2}{3}tan\emptyset°\right); c' = \frac{2}{3}c$ *(for local shear failure)*
3. *Case I ; If* $0 \le D_1 \le D_f$; $q = D_1\gamma + D_2(\gamma_{sat} - \gamma_w)$; *also* γ *at last term replaced by* $\gamma' = \gamma_{sat} - \gamma_w$
4. *Case II ; If* $0 \le d \le B$; $q = \gamma D_f$; $\gamma sat = \gamma$; *and* γ *at last term replaced by* $\bar{\gamma} = \gamma' + \frac{d}{B}(\gamma - \gamma')$
5. *Case III ; when the water table is located so that* $d \ge B$, *the water will have no effect on ultemate bearing capacity.*

FINAL EXAMINATION

SEMESTER / SESSION : SEM 2 / 2015/2016
COURSES : GEOTECHNIC ENGINEERING

PROGRAMME : 2 DAA
COURSES CODE : DAC 21103

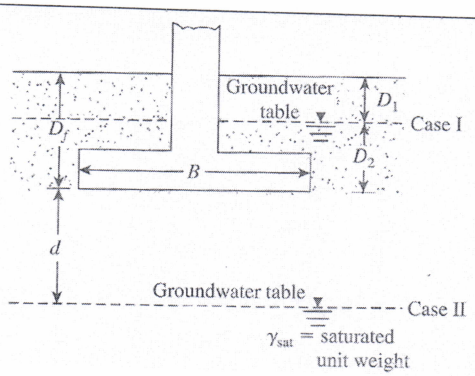

Figure F(i): Effect Of Water Table On Bearing Capacity

9. $Q_{ultimate} = f \cdot A_{Surface} + q \cdot A_{tip}$

$f \cdot A_{Surface} = (Circumference\ of\ pile)(Area\ of\ p_v)(K)(\tan\delta)$

$Circumference\ of\ pile = \pi d$

$q_{tip} = p_v N_q^*$, $A_{tip} = \frac{\pi d^2}{4}$, $Q_{design} = \frac{Q_{ultimate}}{F.S}$

10. $Q_{ultimate} = \alpha c A_{Surface} + cN_c A_{tip}$; $\alpha c A_{Surface} = \alpha_1 c_1 A_{Surface\,1} + \alpha_2 c_2 A_{Surface\,2}$

$A_{surface\,1} = (\pi d)(L_1)$,

11. $K_a = \frac{1-\sin\phi}{1+\sin\phi}$; $K_p = \frac{1+\sin\phi}{1-\sin\phi}$

12. $P_a = \frac{1}{2}\gamma H^2 K_a$; $M_o = P_{a(h)}(H/3)$; $P_p = \frac{1}{2}\gamma H_p{}^2 K_p$

13. $F.S_{gelangsar} = \frac{Daya\ penentangan\ gelangsar}{Daya\ penyebab\ gelangsar} = \frac{\mu(\sum V) + P_p}{P_{a(h)}}$

14. $F.S_{terbalikkan} = \frac{Jumlah\ momen\ menahan}{Jumlah\ momen\ penyebab\ terbalikkan} = \frac{\sum M_r}{\sum M_o}$

15. $FS = \frac{Q_{muktamad}}{Q_v}$; $\bar{x} = \frac{\sum M_A}{V} = \frac{\sum M_r - \sum M_o}{\sum V}$

16. $q = \frac{Q}{A} \pm \frac{M_x y}{I_x} \pm \frac{M_y x}{I_y}$;

FINAL EXAMINATION

SEMESTER / SESSION : SEM 2 / 2015/2016
COURSES : GEOTECHNIC ENGINEERING

PROGRAMME : 2 DAA
COURSES CODE : DAC 21103

Table 1 : Moisture content versus dry density
Jadual 1 : Kandungan lembapan melawan ketumpatan kering

Moisture content, (%)	9.4	11.8	13.8	16.1	18.2	21.4
Dry density, ρ (Mg/m^3)	1.7	1.81	1.85	1.84	1.8	1.72

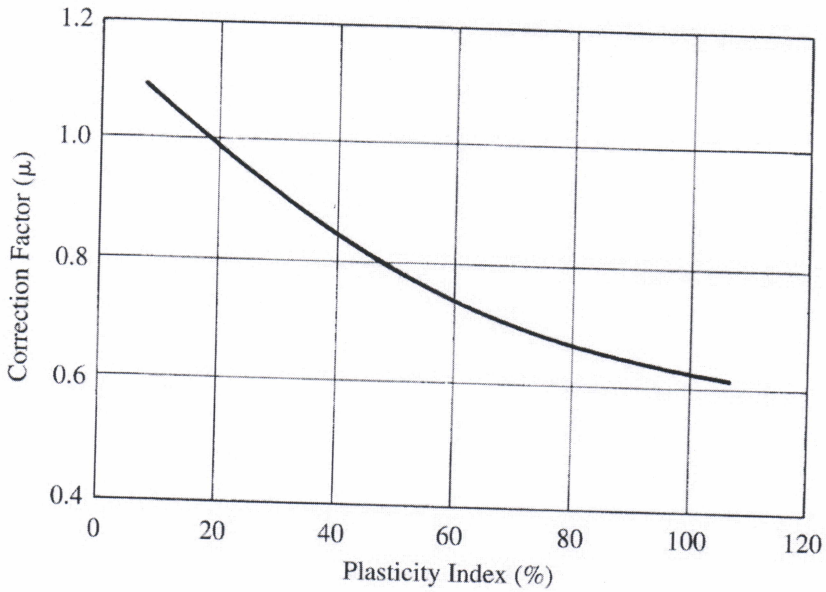

Figure Q1(b) : Corection factor, μ versus PI
Rajah Q1(b) : Faktor pembetulan μ melawan PI

FINAL EXAMINATION

SEMESTER / SESSION : SEM 2 / 2015/2016
COURSES : GEOTECHNIC ENGINEERING

PROGRAMME : 2 DAA
COURSES CODE : DAC 21103

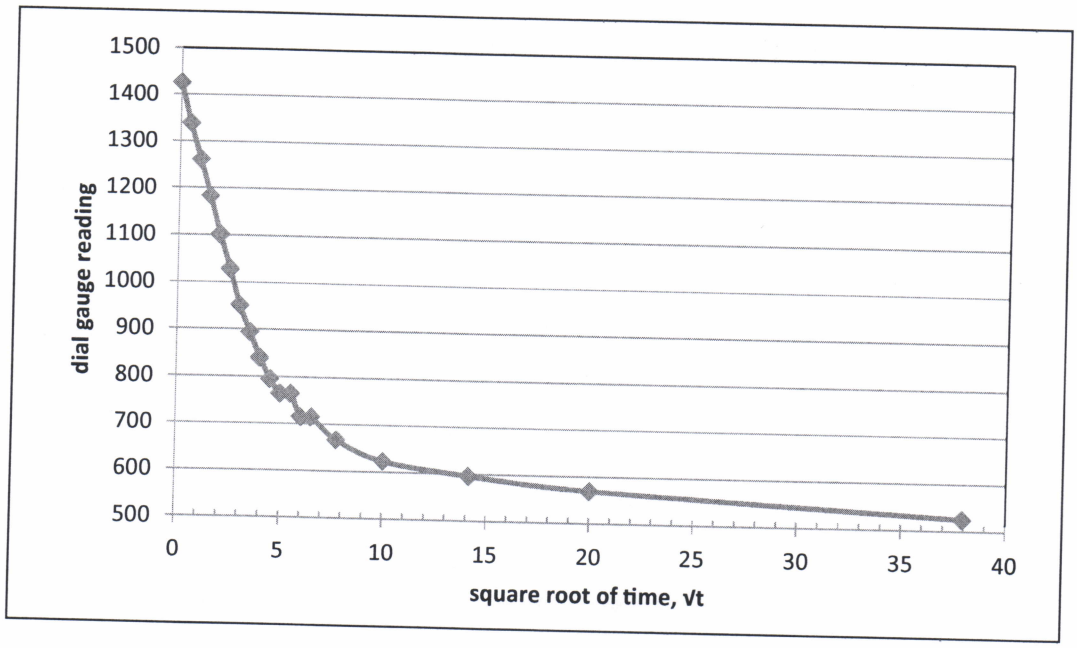

Figure Q2(a) : Curve of dial gauge reading versus √t of a soil sample from a consolidation test

Rajah Q2(a) : Lengkuk bacaan dial gej melawan √t untuk contoh tanah dari ujikaji pengukuhan

Instruction : Please detach this figure and tie up with your answer book
Arahan : Sila tanggalkan rajah ini dan ikatkan bersama buku jawapan anda

FINAL EXAMINATION

SEMESTER / SESSION : SEM 2 / 2015/2016
COURSES : GEOTECHNIC ENGINEERING

PROGRAMME : 2 DAA
COURSES CODE : DAC 21103

Table 2 : Sieve size versus percent passing for the slope soil sample
Jadual 2 : Saiz ayakan melawan peratus melepasi bagi contoh tanah cerun

Sieve size (mm)	3.35	2	1.18	0.6	0.425	0.3	0.212	0.15	0.063	Pan
% Finer	100	98.9	93.1	66.6	38	22.3	13.7	7.9	1.8	0

Table 3(a) : Value of surrounding stress, deviator stress and pore wáter pressure.
Jadual 3(a) : Nilai tegasan keliling, tegasan sisih dan tekanan air liang

Surrounding pressure,σ_3 (kN/m^2)	Deviator stress, $\Delta\sigma_f$ (kN/m^2)	Pore water pressure, u (kN/m^2)
150	192	80
300	341	154
450	504	222

Table 3(b) : CU parameters
Jadual 3(b) : parameter-parameter CU

σ_3	σ_1	σ'_3	σ'_1
150			
300			
450			

FINAL EXAMINATION

SEMESTER / SESSION : SEM 2 / 2015/2016 PROGRAMME : 2 DAA
COURSES : GEOTECHNIC ENGINEERING COURSES CODE : DAC 21103

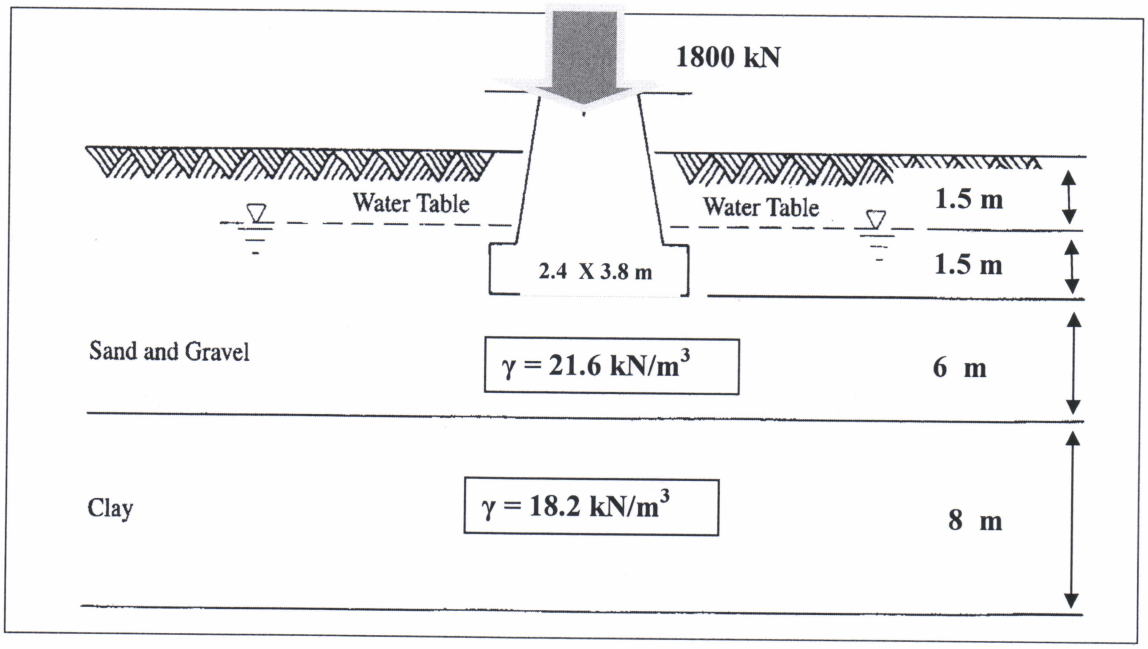

Figure Q3(b)(i) : Pad foundation on layered soil

Rajah S3(b)(i) : Asas pad di atas tanah berlapis

FINAL EXAMINATION

SEMESTER / SESSION : SEM 2 / 2015/2016
COURSES : GEOTECHNIC ENGINEERING

PROGRAMME : 2 DAA
COURSES CODE : DAC 21103

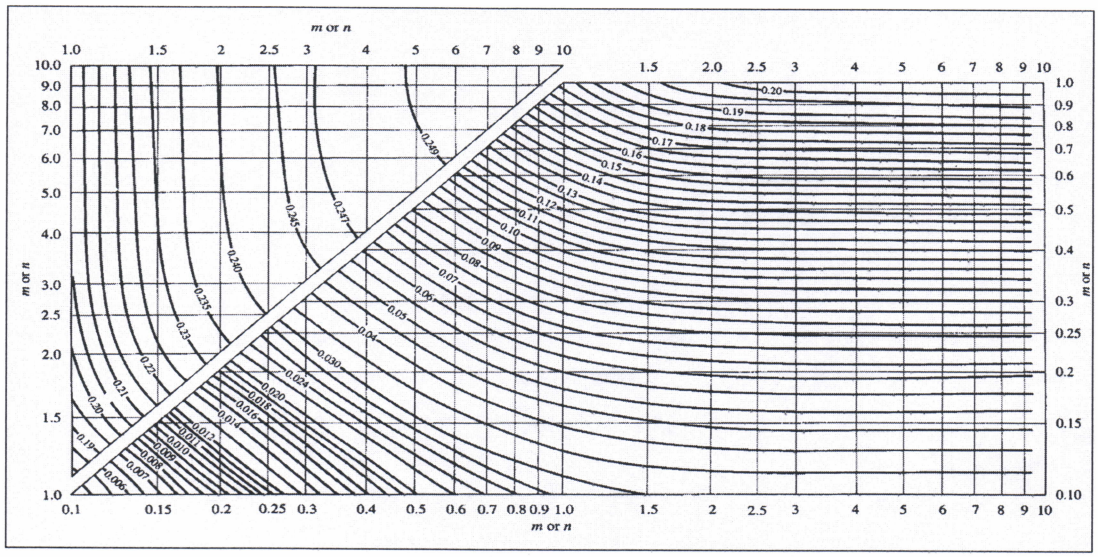

Figure Q3(b)(ii) : Chart for I influence coefficient value

Rajah S3(b)(ii) : Charta untuk nilai pekali pengaruh I

FINAL EXAMINATION

SEMESTER / SESSION : SEM 2 / 2015/2016
COURSES : GEOTECHNIC ENGINEERING

PROGRAMME : 2 DAA
COURSES CODE : DAC 21103

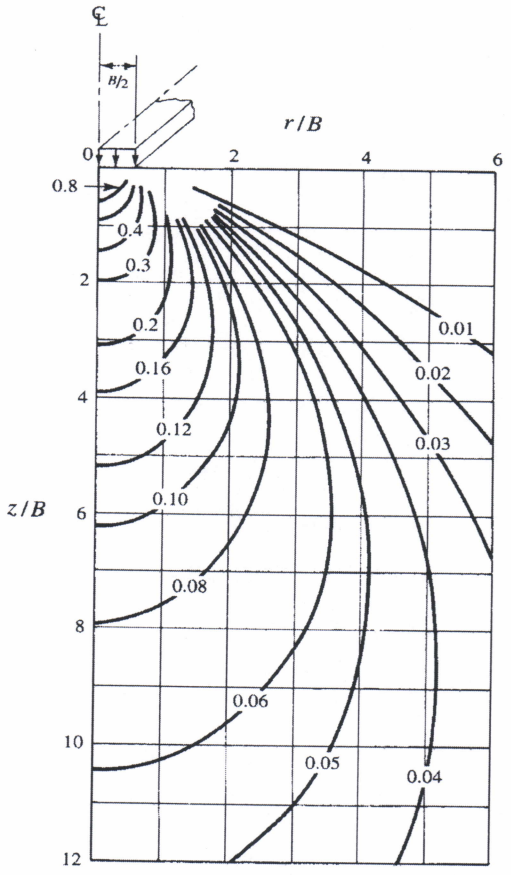

Figure Q3 (c) : Influence coefficient for uniformly loaded strip area
Rajah S3 (c) : Pekali pengaruh untuk beban seragam selanjar

FINAL EXAMINATION

SEMESTER / SESSION : SEM 2 / 2015/2016
COURSES : GEOTECHNIC ENGINEERING

PROGRAMME : 2 DAA
COURSES CODE : DAC 21103

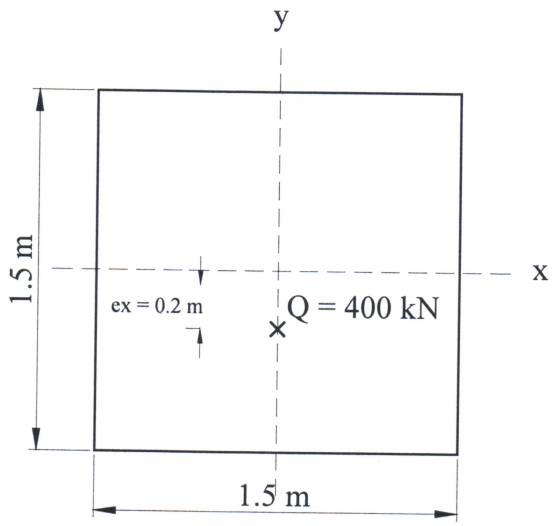

Figure Q4(b) : Eccentric Loading
Rajah S4(b) : Beban Sipi

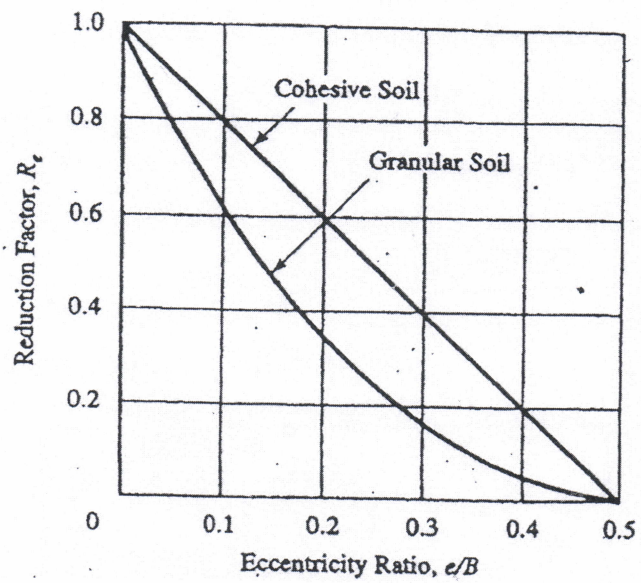

Figure Q4(i) : Reduction Factor for Eccentric Loading
Rajah S4(i) : Faktor Pengurangan Beban Sipi

FINAL EXAMINATION

SEMESTER / SESSION : SEM 2 / 2015/2016
COURSES : GEOTECHNIC ENGINEERING

PROGRAMME : 2 DAA
COURSES CODE : DAC 21103

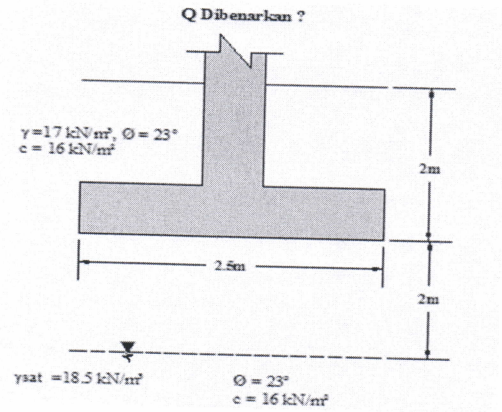

Figure Q4(c) : Shallow foundation

Rajah S4(c) : Asas cetek

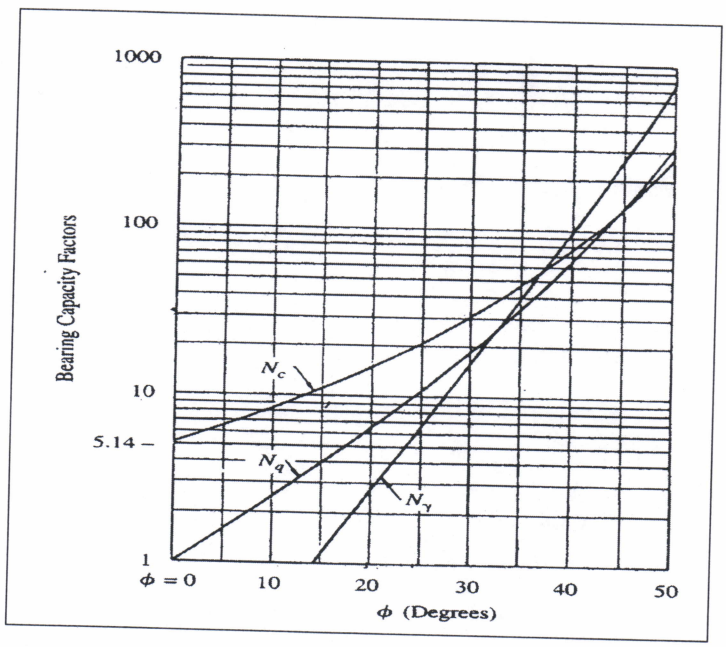

Figure Q4(ii) : Chart shows correlation between bearing capacity factors N_c, N_q, N_γ and ϕ
Rajah S4(ii) : Carta yang menunjukkan perkaitan antarafaktor keupayaan galas N_c, N_q, N_γ dengan ϕ

FINAL EXAMINATION

SEMESTER / SESSION : SEM 2 / 2015/2016
COURSES : GEOTECHNIC ENGINEERING

PROGRAMME : 2 DAA
COURSES CODE : DAC 21103

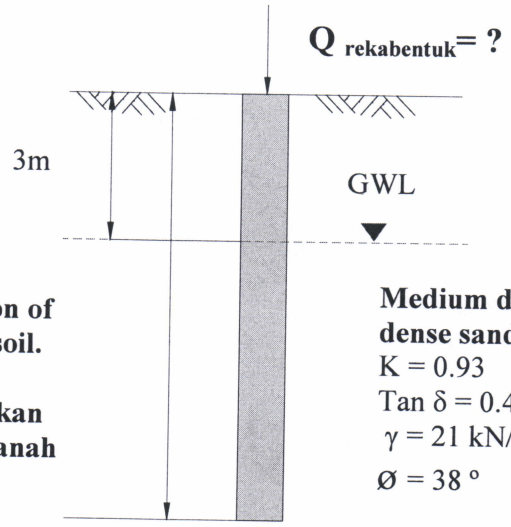

Figure Q5(b)i: Location of circular pile in sandy soil.

Rajah S5(b)i: Kedudukan cerucuk bulat dalam tanah pasir.

Medium dense to dense sand
K = 0.93
Tan δ = 0.45
$\gamma = 21\ kN/m^3$
Ø = 38 °

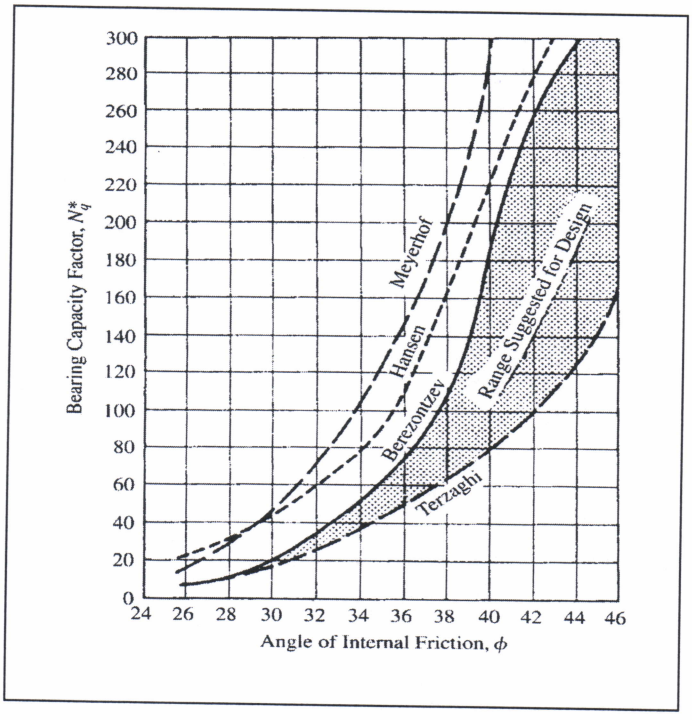

Figure Q5 (b)ii: Value of N^*_q for pile in sand

Rajah S5 (b)ii: Nilai N^*_q Bagi cerucuk dalam pasir

FINAL EXAMINATION

SEMESTER / SESSION : SEM 2 / 2015/2016
COURSES : GEOTECHNIC ENGINEERING

PROGRAMME : 2 DAA
COURSES CODE : DAC 21103

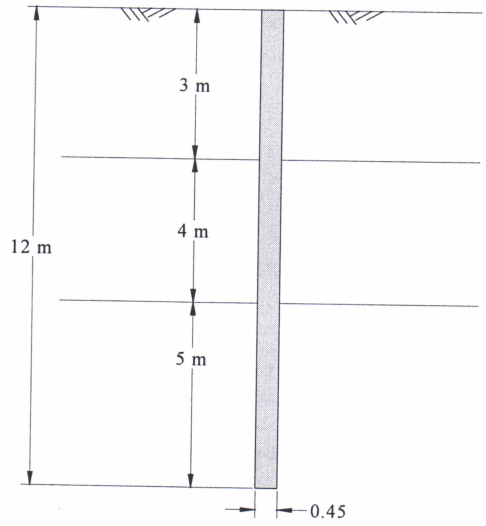

Figure Q5(c)i: Pile in clay
Rajah S5(c)i: Cerucuk dalam tanah liat

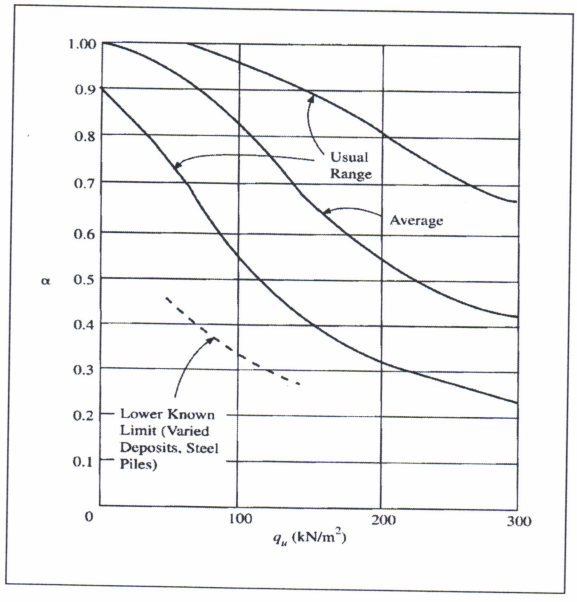

Figure Q5(c)ii: Values of α and q_u for piles in clay
Rajah S5(c)ii: Nilai α dan q_u bagi cerucuk dalam tanah liat

FINAL EXAMINATION

SEMESTER / SESSION : SEM 2 / 2015/2016 PROGRAMME : 2 DAA
COURSES : GEOTECHNIC ENGINEERING COURSES CODE : DAC 21103

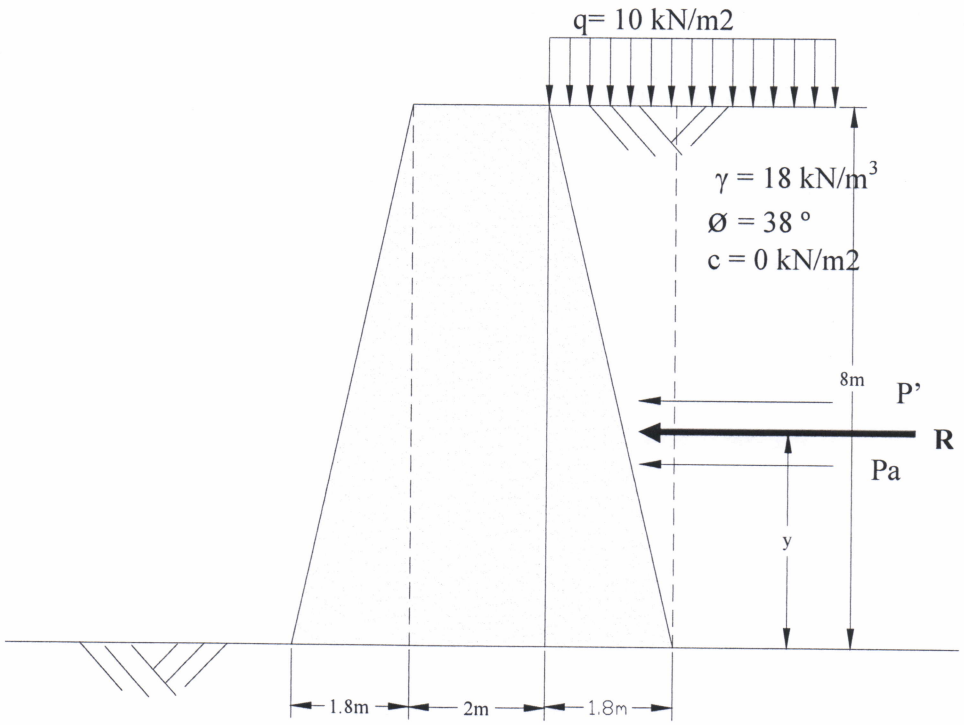

Figure Q6(b): Retaining Wall
Rajah S6(b): Tembok Penahan