

SULIT



BAHAGIAN PEPERIKSAAN DAN PENILAIAN
JABATAN PENDIDIKAN POLITEKNIK
KEMENTERIAN PENDIDIKAN TINGGI

JABATAN MATEMATIK, SAINS DAN KOMPUTER

PEPERIKSAAN AKHIR

SESI JUN 2015

DBM2013: ENGINEERING MATHEMATICS 2

TARIKH : 28 OKTOBER 2015

MASA : 2.30 PM - 4.30 PM (2 JAM)

Kertas ini mengandungi SEMBILAN (9) halaman bercetak.

Bahagian A: Struktur (1 soalan, jawab SEMUA)

Bahagian B: Struktur (4 soalan, jawab 3 soalan)

Dokumen sokongan yang disertakan : Formula

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIARAHKAN

(CLO yang tertera hanya sebagai rujukan)

SULIT

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PLACE TO LEARN BASIC MATHEMATICS

SECTION A : 25 MARKS

BAHAGIAN A : 25 MARKAH

INSTRUCTION:

This section consists of ONE (1) subjective question. Answer ALL the questions.

ARAHAN:

Bahagian ini mengandungi SATU (1) soalan subjektif. Jawab SEMUA soalan.

QUESTION 1

SOALAN 1

CLO1
C2

(a) Simplify the following expressions.

Permudahkan ungkapan berikut.

(i) $x^{\frac{3}{2}} \div x^4 \times x^{-1}$

[3 marks]
[3 markah]

(ii) $\log_2 64$

[3 marks]
[3 markah]

CLO1
C3

(b) Solve the following expressions.

Selesaikan ungkapan berikut.

(i) $27^{4x} = \frac{1}{243}$

[4 marks]
[4 markah]

(ii) $2^{6x} - 8^{10-2x} = 0$

[5 marks]
[5 markah]

(iii) $3 \log 2 + \log(4x - 1) = \log(7 - 8x)$

[5 marks]
[5 markah]

CLO1
C4

(c) Calculate the value of x.

Kirakan nilai x.

$$2 \log 2x + \log 3x = \log 96$$

[5 marks]

[5 markah]

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SECTION B : 75 MARKS
BAHAGIAN B : 75 MARKAH

INSTRUCTION:

This section consists of **FOUR (4)** subjective questions. Answer **THREE (3)** questions only.

ARAHAN:

Bahagian ini mengandungi EMPAT (4) soalan subjektif. Jawab TIGA (3) soalan sahaja.

QUESTION 2
SOALAN 2

CLO2
C3

(a) Differentiate all the following functions.

Bezakan setiap fungsi berikut.

(i) $y = \frac{2x^6 + 4x^5 + 3x}{x}$

[3 marks]
[3 markah]

(ii) $y = (4 - 3x^3)^4$

[4 marks]
[4 markah]

(iii) $y = (x + 2)^2(2x - 3)^4$

[5 marks]
[5 markah]

(iv) $y = 3\sin^2(2x^2 - 1)$

[5 marks]
[5 markah]

CLO2
C4

(b) Solve the stationary points for $y = 3x^3 + x^2$ and determine the maximum and minimum points.

Selesaikan koordinat titik pegun bagi lengkung $y = 3x^3 - 2x$ dan tentukan titik maksimum dan titik minimum.

[8 marks]
[8 markah]

QUESTION 3
SOALAN 3

CLO2
C3

- (a) (i) Find the rate of change of the square area whose side is 8 cm long if the side length is increasing at 2 cm/min.

Cari kadar perubahan luas segi empat sama dimana sisinya adalah 8 cm, jika sisinya bertambah 2 cm/min.

[8 marks]
[8 markah]

- (ii) The parametric equations of a curve are $x = \frac{t^2 - 2}{1 + t}$ and $y = \frac{1}{1 + t}$. Find $\frac{dy}{dx}$ in terms

of t .

Persamaan parameter sebuah lengkung adalah $x = \frac{t^2 - 2}{1 + t}$ dan $y = \frac{1}{1 + t}$. Cari $\frac{dy}{dx}$

dalam sebutan t .

[9 marks]
[9 markah]

CLO2
C4

- (b) Find $\frac{\partial z}{\partial x}$, $\frac{\partial z}{\partial y}$, $\frac{\partial^2 z}{\partial x \partial y}$ and $\frac{\partial^2 z}{\partial y \partial x}$ for the function below.

Cari $\frac{\partial z}{\partial x}$, $\frac{\partial z}{\partial y}$, $\frac{\partial^2 z}{\partial x \partial y}$ and $\frac{\partial^2 z}{\partial y \partial x}$ bagi fungsi di bawah.

$$z = (8x + 3y)(7x + 5y)$$

[8 marks]
[8 markah]

QUESTION 4
SOALAN 4

CLO2
C2

(a) Solve the following integrals.

Selesaikan pengamiran berikut.

(i) $\int (2x^2 + 3) dx$

[2 marks]
[2 markah]

(ii) $\int (4t + 7)^4 dt$

[Use substitution method]

[Guna kaedah gantian]

[4 marks]
[4 markah]

CLO2
C3

(b) Evaluate the definite integrals below.

Tentukan nilai kamiran tentu berikut.

(i) $\int_{-1}^2 (4x - x^2) dx$

[4 marks]
[4 markah]

(ii) $\int_{-2}^{-1} \left(\frac{x^4 + 5x}{x^3} \right) dx$

[6 marks]
[6 markah]

(iii) $\int_1^2 (2x^2 + x) dx + \int_{-2}^3 (2x^2 + x) dx$

[9 marks]
[9 markah]

QUESTION 5
SOALAN 5

CLO2
C3

(a) Integrate each of the following.

Kamirkan setiap yang berikut.

(i) $\int x \cos x \, dx$

[6 marks]
[6 markah]

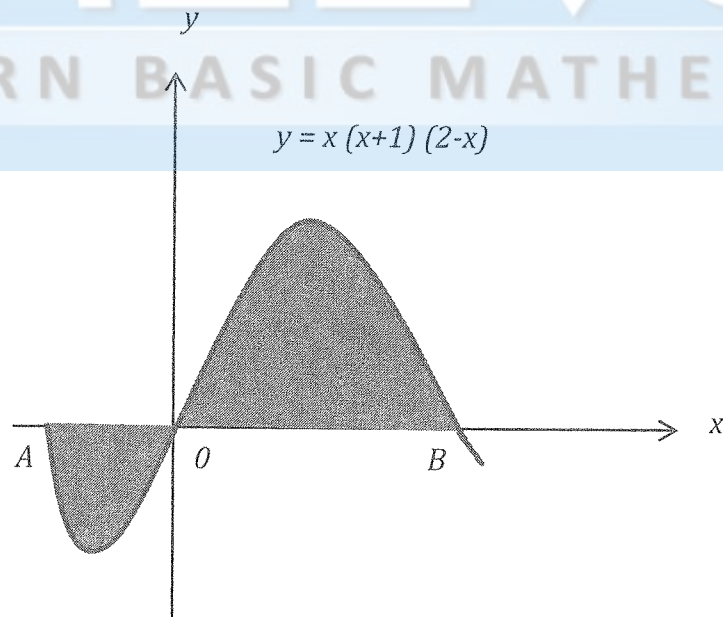
(ii) $\int \frac{2x}{(x+1)(x-3)} \, dx$

[11 marks]
[11 markah]

CLO2
C4

(b) Find the area of the curve below between $x = A$ to $x = B$.

Carikan luas lengkung antara $x = A$ hingga $x = B$ dalam gambar rajah berikut.



[8 marks]
[8 markah]

SOALAN TAMAT