

SULIT



BAHAGIAN PEPERIKSAAN DAN PENILAIAN
JABATAN PENDIDIKAN POLITEKNIK
KEMENTERIAN PENDIDIKAN TINGGI

JABATAN MATEMATIK, SAINS DAN KOMPUTER

PEPERIKSAAN AKHIR
SESI DISEMBER 2015

PBM2024 : ADVANCE MATHEMATICS 2

TARIKH : 11 APRIL 2016
MASA : 11.15 AM – 1.15 PM (2 JAM)

Kertas ini mengandungi LAPAN (8) halaman bercetak.

Bahagian A: Struktur (4 soalan)

Dokumen sokongan yang disertakan : Kertas Graf, Formula

JANGAN BUKA KERTAS SOALANINI SEHINGGA DIARAHKAN

(CLO yang tertera hanya sebagai rujukan)

SULIT

SECTION A : 100 MARKS

BAHAGIAN A : 100 MARKAH

INSTRUCTION:

This section consists of **FOUR (4)** structured questions. Answer **ALL** questions.

ARAHAN:

Bahagian ini mengandungi EMPAT (4) bahagian berstruktur. Jawab SEMUA soalan.

QUESTION 1

SOALAN 1

CLO1
C1

- a) Find $\frac{dy}{dx}$ for the following functions.

Carikan $\frac{dy}{dx}$ untuk fungsi tersebut.

i. $y = 5x^3 + 6x^2 + 7$ [2 marks]

[2 markah]

ii. $y = \frac{7x^5 - 5x + 7}{x^{-2}}$ [3 marks]

[3 markah]

CLO1
C2

- b) Differentiate each of the following functions with respect to x .

Bezakan setiap fungsi berikut terhadap x .

i. $y = 5(6x + 8)^6$ - (Extended Power Rule) [3 marks]

[3 markah]

ii. $y = (3x^4)(5x + 6)^4$ - (Product Rule) [6 marks]

[6 markah]

QUESTION 2

SOALAN 2

CLO1
C1

- a) Determine the gradient for each of the following curves at the given points:

Tentukan nilai kecerunan pada titik yang diberi bagi persamaan lengkung berikut:

i. $y = x^2 + 3x - 4; (1,0)$ [2 marks]

[2 markah]

ii. $y = \frac{2}{x^2} + 3x; \left(2, \frac{12}{2}\right)$ [3 marks]

[3 markah]

CLO1
C2

- b) i. The gradient of the tangent of the curve $y = 2x^3 - 1$ at the point A is 24.

Find the value of coordinates of point A

Kecerunan tangen bagi persamaan lengkungan $y = 2x^3 - 1$ pada titik A ialah 24. Cari nilai koordinat titik A.

[4 marks]

[4 markah]

CLO1
C2

- ii. Find the equation of tangent for $y = x^2 - 4x + 5$ at point (1,2)

Cari persamaan tangen untuk $y = x^2 - 4x + 5$ pada titik (1,2).

[4 marks]

[4 markah]

CLO1
C2

- iii. Find the stationary point of the curve $y = 2x^3 - 12x^2 + 18x + 3$. Hence, determine whether the stationary point is a maximum or minimum point.

Cari titik pegun bagi lengkungan $y = 2x^3 - 12x^2 + 18x + 3$. Seterusnya, tentukan samada titik pegun tersebut adalah titik maximum atau minimum .

[8 marks]

[8 markah]

CLO1

- c) A motorcycle moving along a straight line from the fixed point O. Its displacement s , meter is given by $s = 6t^3 + 6t - 12$ where t is time in seconds after passing O. Find :

Sebuah motosikal bergerak di sepanjang satu garis lurus dari titik O.

Sesarannya ialah $s = 6t^3 + 6t - 12$ di mana t dalam saat adalah masa selepas melalui titik O. Cari:

- i. Displacement, s when $t = 4$ seconds.

[2 marks]

Sesaran ketika masa $t = 4$ saat.

[2 markah]

- ii. Velocity, v of the car at $t = 2$ seconds.

[2 marks]

Kelajuan ketika masa $t = 2$ saat.

[2 markah]

QUESTION 3

SOALAN 3

CLO 2
C1

- a) Complete the following integral.

Selesaikan pengamiran yang berikut.

i. $\int (6x^2 - 1) dx$ [2 marks]

[2 markah]

ii. $\int \left(x^2 - \frac{4}{3}x + 3 \right) dx$ [3 marks]

[3 markah]

CLO 2
C2

- b) Integrate the following functions.

Kamirkan persamaan yang berikut.

i. $\int (5-x)^5 dx$ [4 marks]

[4 markah]

ii. $\int x(x-2) dx$ [4 marks]

[4 markah]

iii. $\int \frac{3k}{2} + 1 dx$ [4 marks]

[4 markah]

iv. $\int \frac{3m^3 + m}{m^3} dx$ [4 marks]

[4 markah]

CLO 2
C3

- c) Evaluate $\int_0^1 \frac{4x^3 + 3x}{3} dx$

[4 marks]

Kirakan $\int_0^1 \frac{4x^3 + 3x}{3} dx$ [4 markah]

QUESTION 4**SOALAN 4**CLO2
C1

- a) Find the area of a region bounded by the straight line $y = 3x - 5$, the x -axis, the lines $x = 2$ and $x = 10$.

Cari luas kawasan yang dilingkungi oleh garis lurus , $y = 3x - 5$ paksi-x pada $x = 2$ dan $x = 10$

[5marks]

[5markah]

CLO2
C2

- b) i. Find the area of a region bounded by the curve, $y = 2x - x^2$, the x -axis , the lines $x = 0$ and $x = 2$

Cari luas kawasan yang dilingkungi oleh lengkung , $y = 2x - x^2$ paksi-x pada $x = 0$ dan $x = 2$.

[8 marks]

[8markah]

CLO2
C2

- ii. Find the area of the region bounded by the curve $y = 2x^3$, the y axis ,the lines $y = 2$ and $y = 5$

Cari luas kawasan yang dilingkungi oleh lengkung, $y = 2x^3$ dimana paksi y , pada $y = 2$ dan $y = 5$

[8marks]

[8markah]

CLO2
C3

- c) Find the volume generated (in terms of π)when the region bounded by the curve $y = x^3 - 2x^2$, the x - axis and the straight line $x=0$ and $x=2$ is rotated 360° about the x - axis.

Cari isipadu janaan (dalam sebutan π) apabila lengkung $y = x^3 - 2x^2$, paksi-x dan garis lurus $x = 0$ dan $x = 2$ dikisar 360° pada paksi-x.

[4marks]

[4markah]

SOALAN TAMAT

DIFFERENTIATION						
1.	$y = ax$ $\frac{dy}{dx} = a$	5.	$y = ax^n$ $\frac{dy}{dx} = n \times ax^{n-1}$			
2.	Chain Rule: $y = (ax + b)^n$ $u = ax + b$ $\frac{dy}{dx} = \frac{du}{dx} \times \frac{dy}{du}$	6.	Extended Power Rule: $y = (ax + b)^n$ $\frac{dy}{dx} = n \times (ax + b)^{n-1} \times \frac{d}{dx}(ax + b)$			
3.	Product Rule: $y = (ax + b)^n(cx + d)^m$ $\frac{dy}{dx} = u \cdot \frac{dv}{dx} + v \cdot \frac{du}{dx}$	7.	Quotient Rule: $y = \frac{(ax + b)^n}{(cx + d)^m}$ $\frac{dy}{dx} = \frac{v \cdot \frac{du}{dx} - u \cdot \frac{dv}{dx}}{(v)^2}$			
4.	Velocity: $v = \frac{ds}{dt}$	8.	Acceleration: $a = \frac{d^2 s}{dt^2}$			
INTEGRATION						
1.	$\int a \, dx = ax + C$, a is any constant	5.	Area Between Curve and x – axis: $A = \int_a^b y \, dx$			
2.	$\int ax^n \, dx = \frac{ax^{n+1}}{n+1} + C$, $\{n \neq -1\}$	6.	Area Between Curve and y – axis: $A = \int_a^b x \, dy$			
3.	$\int (ax + b)^n \, dx = \frac{(ax + b)^{n+1}}{(a)(n+1)} + C$	7.	Area between curve and line/curve about x - axis: $A = \int_a^b [f(x) - g(x)] \, dx$			
4.	$\int_a^b f(x) \, dx = [F(x)]_a^b = F(b) - F(a)$	8.	Area between curve and line/curve about y - axis: $A = \int_a^b [f(y) - g(y)] \, dy$			
9.	Volume revolved 360° along x – axis: $V = \pi \int_a^b [R(x)]^2 \, dx$					
QUADRATIC FORMULA						
$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$						