



FACULTY OF BUSINESS

FINAL EXAMINATION

Student ID (in Figures) :

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Student ID (in Words) :

Subject Code & Name : **MAT1034 BUSINESS MATHEMATICS**

Trimester& Year : January – April 2021

Lecturer/Examiner : Suhada Binti Ishak

Duration : 2 Hours

INSTRUCTIONS TO CANDIDATES

- This question paper consists of 2 parts:**
PART A (30 marks) :TWO (2) short answer questions. Answer are to be written in the separate sheet.
PART B (70 marks) :THREE (3) problem solving questions. Answers are to be written in the separate sheet.
- Only ballpoint pens are allowed to be used in answering the questions.**
- Students must SCAN and UPLOAD the answers in CN by using PDF format.**
- All answers must be submitted in ONE file only.**

WARNING: The University Examination Board (UEB) of BERJAYA University College of regards cheating as a most serious offence and will not hesitate to mete out the appropriate punitive actions according to the severity of the offence committed, and in accordance with the clauses stipulated in the Students' Handbook, up to and including expulsion from BERJAYA University College of Hospitality.

Total Number of pages = 4 (Including the cover page)

PART A : SHORT ANSWER QUESTIONS (30 MARKS)

INSTRUCTION(S) : TWO (2) short answer questions. Answer ALL questions in the Answer Booklet(s) provided.

Question 1

a. Solve for x for the following equations:

i. $5(5x - 7) + 3(3x + 4) > 2(5x + 9) + 9$ (3 mark)

ii. $\frac{1}{4}x + \frac{17}{6} \leq 5x - \frac{16}{3}$ (3 mark)

iii. $20 - 6x \leq 4x - 14 < x - 13$ (3 mark)

b. Shade the region that satisfies the following inequalities. (5 marks)

$$5x + 3y < -15$$

c. En. Rahman is planning to invest RM 35,000 in two projects, A and B. The two projects will gain an annual income of RM 1,900. Project A will pay back 5% per year while Project B will pay back 6% per year due to a higher level risk involved. Hence, determine how much should En. Rahman invests for each project?

[Hint: Use simultaneous equation to solve this question]

(6 marks)

[Total 20 marks]

Question 2

a. Evaluate $\lim_{x \rightarrow \infty} \frac{2x + 3}{x^2 + 1}$ (5 marks)

b. Given $f(x) = \begin{cases} \frac{x^3 - 216}{x - 6} & , x \neq 6 \\ 100 & , x = 6 \end{cases}$

i. Find $\lim_{x \rightarrow 6} f(x)$ (3 marks)

ii. Determine whether $f(x)$ continuous at $x = 6$. Give your reason. (2 marks)

[Total 10 marks]

END OF PART A

PART B : PROBLEM SOLVING QUESTIONS (70 MARKS)

INSTRUCTION(S) : THREE (3) problem solving questions. Answer ALL questions in the Answer Booklet(s) provided.

Question 1

a) Differentiate the following with respect to x .

i. $f(x) = (x + 3)^6$ (3 marks)

ii. $f(x) = (3x^2 + 7)(6 - 5x)$ (3 marks)

iii. $f(x) = \frac{2}{(3x^2 - 1)^{\frac{1}{5}}}$ (3 marks)

b) Compute the second and third derivatives for the following function.

$f(x) = 5x^3 + 3x^2 + 2x + 5$ (4 marks)

c) Determine the critical point(s) by using second derivative test of the curve.

$f(x) = 2x^3 - 3x^2 - 12x + 2$. Hence, sketch the graph. (12 marks)

[Total 25 marks]

Question 2

a) Compute the integral for the following function by using basic rules of integration.

i. $\int \frac{-2}{x^3} dx$ (2 marks)

ii. $\int \sqrt[6]{x^5} dx$ (2 marks)

iii. $\int \frac{2x^2 - 3x}{x} dx$ (2 marks)

iv. $\int (3x^2 + 2)x^3 dx$ (2 marks)

v. $\int \frac{7}{1 - 3x} dx$ (2 marks)

b) Using suggested substitution, determine the integral for the function

$\int 3x^2 (x^3 + 3)^4 dx, u = x^3 + 3$ (5 marks)

c) By using integration by partial fraction, evaluate the following integral

$\int \frac{x^3 + 4x^2 + 3x - 4}{x^2 + 4x + 3} dx$ (10 marks)

[Total 25 marks]

Question 4

For the function $f(x) = x^4 - 8x^2$, find

- a) The stationary points. (3 marks)
- b) The intervals where f is increasing or decreasing. (3 marks)
- c) The relative maximum and relative minimum points. (2 marks)
- d) The interval where f is concave upwards and f is concave downwards. (4 marks)
- e) The points of inflection. (4 marks)
- f) Hence, sketch the graph of $f(x)$. (4 marks)

[Total 20 marks]

END OF EXAM PAPERS