BERJAYA
UNIVERSITY COLLEGE

FACULTY OF BUSINESS

FINAL EXAMINATION

Student ID (in Figures)   :

Student ID (in Words)   :

Course Code & Name	:	**MAT1013 Business Mathematics**
Trimester & Year	:	SEPTEMBER – DECEMBER 2020
Lecturer/Examiner	:	Dr. TEY SHEIK KYIN
Duration	:	2 Hours

INSTRUCTONS TO CANDIDATES

1. This question paper consists of TWO (2) parts:

    PART A (30 marks)   :   FIVE (5) short answer questions. Answers are to be shaded in the Multiple Choices Answer Sheet provided.

    PART B (70 marks)   :   THREE (3) problem solving questions. Answers are to be written in the Answer Booklet provided.

2. Candidates are not allowed to bring any unauthorized materials except writing equipment into the Examination Hall. Electronic dictionaries are strictly prohibited.
3. This question paper must be submitted along with all used and/or unused rough papers and/or graph paper (if any). Candidates are NOT allowed to take any examination materials out of the examination hall.
4. Only ballpoint pens are allowed to be used in answering the questions, with the exception of multiple choice questions, where 2B pencils are to be used.

WARNING: The University Examination Board (UEB) of BERJAYA University College 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.

Total Number of pages = 5 (Including the cover page)

PART A : **SHORT ANSWER QUESTIONS [30 marks]**

INSTRUCTION(S) : **FIVE (5)** short answer questions. Answer **ALL** questions in the Answer Booklet(s) provided.

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1. Raymond deposited RM500 every month into an account for 10 years at 8% interest compounded monthly. Calculate the total amount at the end of 10 years.

(4 marks)

2. Given $A = \begin{bmatrix} 2 & -1 & 3 \\ 0 & 4 & -2 \end{bmatrix}$, $B = \begin{bmatrix} -3 & 1 \\ 2 & 5 \end{bmatrix}$, $C = \begin{bmatrix} -1 & 0 & 2 \\ 4 & -3 & 1 \\ -2 & 3 & 5 \end{bmatrix}$, $D = \begin{bmatrix} 3 & -2 \\ 0 & -1 \\ 1 & 2 \end{bmatrix}$

   Perform the indicated operations.
   (a) AC

(2 marks)

   (b) B + AD

(4 marks)

3. Find all vertical and horizontal asymptotes of the function
   (a) $f(x) = \frac{x^2+1}{x^2-1}$

(6 marks)

   (b) $f(x) = \frac{2x^2+3x-2}{x^2-x-2}$

(6 marks)

4. Given $f(x) = x^2 - 4x$,
   (a) Find $f'(x)$ and $f''(x)$

(2 marks)

   (b) Find the slopes of the line tangent to the graph of f at $x = 4$ and $x = 6$

(2 marks)

5. In your algebra class your first four exam grades are 72, 65, 69 and 70. Wat is the lowest score you can get on the fifth exam to earn a C for the course? Assume that each exam is equal in weight and a C is any score greater than or equal to 70.

(4 marks)

[Total: 30 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.

1. Given system of equations
$7x - 3y + 2z = 0$
$4x - 4y - z = 2$
$5x + 2y + 3z = 1$

   (a) Solving a system using elimination method.

   (10 marks)

   (b) Form the Augmented matrix and solve using method of reduction.

   (15 marks)
   [Total: 25 marks]

2. The cost and price in ringgit for a certain product are given by the formulae C(x) = 75x + 25000 and p = 150 – 0.01x respectively. Find:

   (a) The marginal cost function.

   (2 marks)

   (b) The total revenue function and marginal revenue function.

   (5 marks)

   (c) The marginal revenue at the production level of 1500. Interpret the results.

   (3 marks)

   (d) The profit function.

   (3 marks)

   (e) The level of output which will maximize the profit and the amount of the profit at profit maximization output level.

   (5 marks)
   [Total: 18 marks]

3.   Given the linear programming problems
$$10x + 2y \geq 84$$
$$8x + 4y \geq 120$$
$$x, y \geq 0$$

(a)   Graph the system of inequalities and indicate whether solution region is bounded or unbounded. (Hint: without graph paper)

(13 marks)

(b)   Find the corner points.

(9 marks)

(c)   Assume that objective is minimize the function, $C = 3x + y$.
       Determine the optimal solution.

(5 marks)
[Total: 27 marks]

END OF EXAM PAPER

Appendix

		where
1.	Future value, $S = P(1+i)^n$	P = principal/ present value
2.	Future value of annuity, $S = R\left[\dfrac{(1+i)^n-1}{i}\right]$	i = interest rate
3.	Present value of annuity, A $=R\left[\dfrac{1-\frac{1}{(1+i)^n}}{i}\right]$	n = time period/number of year R = periodic payments