

**FACULTY OF BUSINESS****FINAL EXAMINATION**Student ID (in Figures) :

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Student ID (in Words) : _____

Course Code & Name : **MAT1513 Mathematics for Business**
Trimester & Year : SEPTEMBER – DECEMBER 2020
Lecturer/Examiner : DR TEY SHEIK KYIN
Duration : 3 Hours

INSTRUCTIONS TO CANDIDATES

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

PART A (30 marks) : THIRTY (30) multiple choice questions. Answers are to be written in the 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 = 9 (Including the cover page)

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 a system of three linear equations in three variables.

$$3x_1 - x_2 + x_3 = -15$$

$$x_1 + 2x_2 - x_3 = 1$$

$$2x_1 + 3x_2 - 2x_3 = 0$$

a. Solving a system of three linear equations using elimination method.

(10 marks)

b. Form Augmented matrix and solve using Gauss-Jordan Elimination.

(13 marks)

[Total: 23 marks]

2. The following is given for a product of a company.

Marginal cost function, $C'(x) = 20 + 0.2x$

Fixed cost: RM500, and

Demand function, $p = 108 - x$.

Find:

(a) Total revenue function.

(4 marks)

(b) Total cost function.

(5 marks)

(c) The level of production in which profit is maximized.

(5 marks)

(d) The maximum profit, total revenue and total cost when profit is maximized.

(8 marks)

[Total: 22 marks]

3. Given the linear programming problems state as follows:

$$\begin{array}{l} \text{Minimize and maximize} \quad P = 20x + 10y \\ \text{Subject to} \quad 2x + 3y \geq 30 \\ \quad \quad \quad 2x + y \leq 26 \\ \quad \quad \quad -2x + 5y \leq 34 \\ \quad \quad \quad x, y \geq 0 \end{array}$$

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

(11 marks)

(b) Identify the corner points.

(9 marks)

(c) Use the objective function to discuss the existence of a maximum value and a minimum value.

(5 marks)

[Total: 25 marks]

END OF EXAM PAPER

Appendix

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