Private & Confidential

FACULTY OF BUSINESS

FINAL EXAMINATION

Student ID (in Figures)	:	
Student ID (in Words)	:	

Course Code & Name	:	**MAT1513 MATHEMATICS FOR BUSINESS**
Semester & Year	:	January – April 2022
Lecturer/Examiner	:	Suhada Ishak
Duration	:	3 Hours

INSTRUCTIONS TO CANDIDATES

1. **This question paper consists of 2 parts:**
   PART A (30 marks) : **THIRTY (30) multiple choice questions. Answers are to be written in the Multiple Choice Answer Sheet provided.**
   PART B (70 marks) : **FOUR (4) problem solving questions. Answers are to be written in the Answer Booklet provided.**
2. **Candidates are not allowed to bring any unauthorised 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 = 10 (Including the cover page)

PART B : **PROBLEM SOLVING QUESTIONS (70 MARKS)**

INSTRUCTION(S) : **FOUR (4)** problem solving questions. Answer **ALL** questions. Answers are to be written in the Answer Booklet provided.

Question 1

a. Calculate the missing values.

P(in RM)	r	t	S(in RM)
2,300	5%	30 months	_____
5,000	12%	_____days	5,500
_____	10.50%	180 days	13,051
10,000	———	18 months	11,050

(8 marks)

b. Samuel invested RM 10,000 into an account that pays an interest of 8% compounded monthly. Initially, he intended to keep the account untouched for 6 years. However, after 3 years, he had to withdraw RM 5,000. Compute the amount left in the account six years from the time he made the investment.

(3 marks)

c. Suhaila is investing RM 1,000 at the end of every months in a scheme which pays an interest of 5.5% compounded monthly. The accumulated amount at the end of five years will be enough for down payment of a new house.

i. Calculate the amount of this down payment.

ii. Determine the amount of interest earned in the scheme.

(4 marks)

[Total: 15 marks]

Question 2

a. Solve the following system of equation using Cramer's rule:

$$\begin{bmatrix} 4 & 1 & 0 \\ 1 & 0 & 2 \\ 2 & 2 & -2 \end{bmatrix} \begin{bmatrix} p \\ q \\ r \end{bmatrix} = \begin{bmatrix} 8 \\ -3 \\ 14 \end{bmatrix}$$

(10 marks)

b. A shop sells two different size of product; small and large. Two different supermarkets get their supplies from this shop. Supermarket A buys 100 small size and 50 large size and pays RM 1,300.00. Supermarket B buys 30 small size and 25 large size and pays RM 600.00.

i. From the information above, identify a system of linear equations.

ii. Transform the above linear equations in the form of matrix equation. Hence, using inverse matrix, $X = A^{-1}b$, determine the price of a small, medium and large size of the products.

(10 marks)

[Total: 20 marks]

Question 3

a. Differentiate the following with respect to x

i. $f(x) = \left(\sqrt{2x} - 3\right)\left(2x^2 - 7\right)$ (3marks)

ii. $y = \sqrt[5]{3x^2 - 4}$ (3marks)

iii. $f(x) = \dfrac{(x^2 + 10)^5}{\left(9 - x^2\right)^8}$ (3marks)

b. Find the second and third derivatives for the following function

$$f(x) = \frac{5x}{-6x + 7}$$ (6 marks)

[Total: 15 marks]

Question 4

a. Using basic rules of integration, find

i. $\int \sqrt[7]{x^3}\,dx$ (2 marks)

ii. $\int \frac{-5}{x^3}\,dx$ (2 marks)

iii. $\int \frac{4x^3 + 1}{x^2}\,dx$ (2 marks)

iv. $\int x^5(-2x - 7)dx$ (2 marks)

b. Solve the following linear programming problem graphically.

Minimise Cost, $C = X + 2Y$

Subject to

$$X + 3Y \geq 900$$
$$8X + 2Y \geq 1,600$$
$$3X + 2Y \geq 1,200$$
$$Y \leq 700$$
$$X, Y \geq 0$$

(12 marks)

[Total: 20marks]

END OF QUESTION PAPER