



Private & Confidential

FACULTY OF BUSINESS

FINAL EXAMINATION

Student ID (in Figures) :

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Student ID (in Words) : _____

Subject Code & Name : **MAT1513 MATHEMATICS FOR BUSINESS**
Semester& Year : January – April 2024
Lecturer/Examiner : Suhada Binti Ishak
Duration : 3 Hours

INSTRUCTIONS TO CANDIDATES

1. This question paper consists of 2 parts:
PART A (30 marks) : THIRTY (30) multiple choice questions. Answer ALL questions. Shade your answers in the Multiple Choice Answer Sheet provided.
PART B (70 marks) : FOUR (4) problem solving questions. Answer ALL questions. Answers are to be written in the Answer Booklet provided.
2. Candidates are not allowed to bring any unauthorized materials except writing equipment and scientific calculator 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 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 = 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) Find the **future value** and **interest earned** for the following investment with n investment of P ringgit at $r\%$.

P	$r\%$	n
RM 10,000	2.5% compounded monthly	24
RM 3,500	8% compounded quarterly	20
RM 9,500	1.5% compounded annually	36

(9 marks)

- b) Calculate the periodic payments, R that have to be made to settle the following loans.

Value of the loan (RM)	Interest	Period	Payment
RM 5,500	7% compounded quarterly	5 years	Quarterly
RM 50,000	2.5% compounded semi-annually	3 years	Semi annually
RM 450,000	3.1% compounded monthly	35 years	Monthly

(6 marks)

[Total: 15 marks]

QUESTION 2

- a. Given the following equations

$$\begin{cases} 2x + y = 5 \\ 7x + 4y = 7 \end{cases}$$

- i. Write the system of equation in matrix form ($Ax = b$). (2 marks)
- ii. Find the inverse matrix (A^{-1}) of matrix A. (3 marks)
- iii. Using inverse matrix (A^{-1}), solve the equations. (5marks)

- b. You would like to have RM75,000 in 15 years. To accumulate this amount, you plan to deposit an equal sum in the bank each year that will earn 8% interest compounded annually. Your first payment will be made at the end of the year.
- How much must you deposit annually to accumulate this amount?
(5 marks)
 - If you decide to make a large lump-sum deposit today instead of the annual deposits, how large should the lump-sum deposit be? (Assume you can earn 8% on this deposit).
(5 marks)

[Total: 20 marks]

Question 3

- Let $p = 10,000 - 12\sqrt{q}$ be the demand function for a manufacturer's product. Find the rate of change of price p per unit with respect to quantity q . How fast is the price changing with respect to q when $q = 9$? Assume that p is in Ringgit Malaysia.
(6 marks)
- A manufacturer determines that x units of particular luxury item will be sold when the price is $p(x) = 112 - x \ln x^3$ hundred Ringgit Malaysia per unit.
 - Find the revenue and marginal revenue functions.
(7 marks)
 - Find the marginal revenue when $x = 4$.
(2 marks)

[Total: 15 marks]

Question 4

An-Nur clothing lines produces thousands of shawls monthly. If the marginal cost (MC) for manufacturing these shawls is governed by the function:

$$MC(q) = 360 - 4q$$

with the marginal revenue (MR) of :

$$MR(q) = 4q - 600$$

- Formulate the total cost function if the fixed costs are RM10,000.
(5 marks)
- Construct the demand function.
(5 marks)
- By using a graph paper, sketch the profit graph. Hence, determine the number of units required for An-Nur to make a profit.
(10 marks)

[Total: 20 marks]

END OF EXAM QUESTIONS