



**UNIVERSITI KUALA LUMPUR
BUSINESS SCHOOL**

**FINAL EXAMINATION
MARCH 2026 SEMESTER**

COURSE CODE	: EIB10503
COURSE TITLE	: BUSINESS MATHEMATICS
PROGRAMME NAME	: BACHELOR OF BUSINESS ADMINISTRATION (HONS)
DATE	: 24 JUNE 2026
TIME	: 2.00PM – 5.00PM
DURATION	: 3 HOURS

INSTRUCTIONS TO CANDIDATES

1. Please read the instructions given in the question paper **CAREFULLY** .
2. This question paper is printed on both sides of the paper.
3. This question paper consists of **ONE** sections.
4. Section A consists of five questions. Answer **FOUR (4)** questions only.
5. Please write your answers on the answer booklet provided.
6. Please answer all questions in **ENGLISH** only.
7. Refer to the attached Formula / Appendices. ☐ *Tick if applicable*

SECTION A (Total: 100 marks)

Answer FOUR (4) questions.

Please use the answer booklet provided.

Question 1

Answer all of the following questions:

- (a) Determine the coordinates of the points at which the curve $y = x^2 + 1$ intersects the straight line $y = x + 3$.
(3 marks)

- (b) Find the inverse of the matrix A , where

$$A = \begin{bmatrix} 2 & 1 & 0 \\ 1 & 3 & 2 \\ 0 & 2 & 1 \end{bmatrix}$$

(8 marks)

- (c) A shop sells a jacket for RM120. The selling price includes a markup of 25% based on the cost price. Find the cost price of the jacket.

(3 marks)

- (d) A customer buys a laptop costing RM5,000. He pays RM1,500 upfront. The remaining balance is financed at 6% simple interest per annum for 2 years. Find the total amount paid by the customer.

(4 marks)

- (e) The fifth terms of an arithmetic progression is 12. The sum of the first five terms is 40. Find the first term and the common difference.

(3 marks)

- (f) A function $f(x)$ is defined as:

- i. $f(x) = 3x^2 - 4x + 7$. Find the value of $f'(2)$

(2 marks)

- ii. $f(x) = \sqrt{x} - 3x$. Find the value of $f'(1)$

(2 marks)

Question 2

Answer all of the following questions:

- (a) Solve the system of equations using a matrix method or Cramer's Rule:

$$\begin{cases} 2x + y = 7 \\ 3x - 2y = 4 \end{cases}$$

(4 marks)

- (b) Given the quadratic function $y = x^2 - 6x + 5$, find:

i. The coordinates of the vertex.

(2 marks)

ii. The x-intercept of the graph.

(2 marks)

- (c) Yunus earns RM2,500 in 2020. His salary increases by 4% each year. Find his salary in 2026.

(4 marks)

- (d) Evaluate the following integral:

$$\int_1^3 (2x^3 - x + 3) dx$$

(4 marks)

- (e) Danish invests RM10,000 at 5% simple interest for 4 years.

i. Find the total amount at the end of 4 years.

(2 marks)

ii. Find the total interest earned.

(1 marks)

- iii. State the interest earned in the third year.

(1 marks)

- (f) A retailer offers successive discounts of 10% and 5% on a product priced at RM500.

- i. Find the net price of the product.

(1 marks)

- ii. Find the total discount given.

(2 marks)

- iii. Find the single equivalent discount percentage.

(2 marks)

Question 3

Answer all of the following questions:

- (a) Solve the system of equations using the inverse matrix method:

$$\begin{cases} x + y + z = 6 \\ 2x + 3y + z = 10 \\ x + 2y + 3z = 11 \end{cases}$$

(9 marks)

- (b) An investment of RM2,000 earns 6% simple interest per annum for 5 years. Find the interest earned and the total amount at the end of the investment.

(3 marks)

- (c) RM5,000 is deposited at 4% per annum compounded annually.

i. Find the amount after 6 years.

(2 marks)

ii. Estimate how many years it will take for the investment to reach RM6500.

(3 marks)

- (d) A product is sold for RM80 after a 20% markdown. The business applies a 50% markup on cost. Find the original cost of the product.

(4 marks)

- (e) Given

$$A = \begin{bmatrix} 1 & 2 \\ 3 & 1 \end{bmatrix}, B = \begin{bmatrix} 4 & -1 \\ 2 & 3 \end{bmatrix}$$

Show that $AB \neq BA$.

(4 marks)

Question 4

Answer all of the following questions:

- (a) Consider the following linear equations: $2y - 3x = 5$
 $y = \frac{1}{2}x + 4$

i. Sketch both lines on the same Cartesian plane.

(3 marks)

ii. Hence, find the coordinates of their point of intersection.

(2 marks)

- (b) Solve the quadratic equation: $2x^2 - 7x + 3 = 0$.

i. Use the quadratic formula to find the roots of the equation.

(3 marks)

ii. Hence, express $2x^2 - 7x + 3$ in factorised form.

(2 marks)

- (c) Given

$$\begin{pmatrix} 3 & k \\ 2 & 4 \end{pmatrix}$$

i. Find the determinant of A.

(2 marks)

ii. Find the value of k if A is singular.

(3 marks)

- (d) A company produces gadgets. The cost of producing x units is given by $C = 5x + 200$. The selling price per unit is RM10.

i. Determine the number of units required for the company to break even.

(3 marks)

- ii. Calculate the profit when 50 units are produced and sold.

(3 marks)

- (e) RM283 is deposited at the end of every month for 3 years 4 months at 9% per annum compounded monthly.
Find the future value of the investment at the end of the period and hence determine the total interest earned.

(4 marks)

Question 5

Answer all of the following questions:

- (a) A certain sum of money is invested for a fixed period. It amounts to RM850 at 7% per annum simple interest. If invested at 4% per annum, it amounts to RM815. Find the time of investment.

(4 marks)

- (b) The net price of a product after allowing trade discounts of 28% and 18% was RM7,888. Calculate:

- i. The list price of the product.

(2 marks)

- ii. The amount to be paid if the invoice with cash terms of 4/5, 2/10, n/30 was paid 9 days after the date of the invoice.

(2 marks)

- (c) Find $\frac{d^2y}{dx^2}$ for each of the following functions:

- i. $y=4x^3-6x^2+5x-9$

(2 marks)

- ii. $y=2x^4-3x^3+4x^2-7x+1$

(2 marks)

- (d) Given the following supply and demand functions:

$$P = 2Q + 8$$

$$P = -\frac{3}{2}Q + 50$$

- i. Determine the equilibrium price and quantity.

(5 marks)

- ii. Using the supply and demand functions, calculate the quantity supplied and quantity demanded at a price of RM30 (below equilibrium), and hence determine whether a shortage or surplus exists in the market.

(4 marks)

- (e) Evaluate the following integral:

$$\int_1^4 \frac{2x+3}{x} dx$$

(4 marks)

END OF EXAMINATION PAPER

MATHEMATICAL FORMULAE OF BUSINESS MATHEMATICS/MATHEMATICS OF BUSINESS

FUNCTIONS & GRAPHS	
Linear Function: $y = mx + c$ or $ax + by = c$ or $y - y_1 = m(x - x_1)$ Slope: $m = \frac{y_2 - y_1}{x_2 - x_1}$	Quadratic Function: $y = ax^2 + bx + c = 0$ Quadratic Formula: $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ Axis of Symmetry (AOS)/Vertex: $x = \frac{-b}{2a}$ Vertex: $(x, f(x))$
APPLICATION OF FUNCTIONS	
$R(x)$ = Unit Price x Total Quantity Sold $TC/C(x) = FC + VC$ $P(x) = R(x) - C(x)$	Break-Even Point = $\frac{\text{Fixed Cost}}{\text{Selling Price per Unit} - \text{Variable Cost per Unit}}$ Break - Even: $R(x) = C(x)$
MATRICES	
2×2 Matrix Determinant $ A = ad - bc$ Matrix Inverse $A^{-1} = \frac{1}{ad - bc} \begin{bmatrix} d & -b \\ -c & a \end{bmatrix}$	3×3 Matrix Inverse $A^{-1} = \frac{1}{\det(A)} \text{adj}(A)$ or $A^{-1} = \frac{1}{\det(A)} (\text{cofactor of matrix } A(A))^T$
SEQUENCES	
Arithmetic Sequence $T_n = a + (n - 1)d$ $S_n = \frac{n}{2} [2a + (n - 1)d]$	Geometric Sequence $T_n = ar^{n-1}$ $S_n = \frac{a(1 - r^n)}{1 - r}, r < 1$ $S_n = \frac{a(r^n - 1)}{r - 1}, r > 1$
INTEREST	
Simple Interest $I = Prt$ $S = P + I$ or $S = P(1 + rt)$	Compound Interest $S = P(1 + i)^n$ where: $i = \frac{k}{m}, n = mt$ Interest amount: $I = S - P$

Annuity Future Value $S = R \left(\frac{(1+i)^n - 1}{i} \right)$	Annuity Present Value $A = R \left(\frac{1 - (1+i)^{-n}}{i} \right)$
Trade And Cash Discount Trade Discount = List Price $\times$ Trade Discount rate Net Price (NP) = List Price – Trade Discount or $NP = \text{List Price} \times (1 - \text{Trade Discount Rate})$ Amount Credited = $\frac{\text{Partial Payment}}{(1-d)}$ Balance of Account = Value of Invoice – Amount Credited	
Markup And Markdown Markup $R = C + M$ Markdown $MD = OP - NRP$ Net Profit $R = C + NP + OE$	
DIFFERENTIATION	
Standard Form $\frac{d}{dx} \ln x = \frac{1}{x}$ $\frac{d}{dx} e^x = e^x$	General Form $\frac{d}{dx} \ln (f(x)) = \frac{f'(x)}{f(x)}$ $\frac{d}{dx} e^{f(x)} = f'(x) e^{f(x)}$
INTEGRATION	
Standard Form $\int e^x dx = e^x + c$ $\int \frac{1}{x} dx = \ln x + c$	General Form Where: $f(x) = ax + b$ $\int e^{f(x)} dx = \frac{e^{f(x)}}{f'(x)} + c$ $\int \frac{1}{f(x)} dx = \frac{\ln f(x) }{f'(x)} + c$