



PENINSULA
COLLEGE
GEORGETOWN DK266-03(P)

FINAL EXAMINATION

Semester	:	SEPTEMBER 2025 SEMESTER
Programme Name	:	DIPLOMA IN LOGISTIC MANAGEMENT DIPLOMA IN BUSINESS STUDIES DIPLOMA OF ACCOUNTANCY
Course Code & Name	:	DBMT3013 BUSINESS MATHEMATICS
Duration	:	3 HOURS

INSTRUCTIONS TO CANDIDATES:

1. Please read the instructions given in the question paper **CAREFULLY**.
2. The question paper consists of **FOUR (4)** questions.
3. Answer **ALL** questions in the question paper.
4. Answers to the questions are to be written into the examination booklet.
5. Electronic dictionaries, lecture notes, files or any unauthorised materials except writing equipment are strictly prohibited.

This question paper must be submitted along with all used and/or unused rough papers and/ or graph papers (if any). Candidates are **NOT ALLOWED** to take any examination paper(s) used or unused out of the examination hall.

WARNING:

The Examination Board of Peninsula College Georgetown regards cheating as a very 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 Peninsula College Georgetown.

(This booklet contains 5 printed pages including this page)

DO NOT OPEN THIS BOOKLET UNTIL YOU ARE ALLOWED TO DO SO

Answer **ALL** questions on the separate sheet provided.

[100 marks]

1. a) The third term of a geometric progression is **360** and the sixth term is **1,215**.
 - i) Identify the first term. (6 marks)
 - ii) Compute the sum of the first ten terms. (4 marks)

 - b) Prepare a depreciation schedule using the **straight-line method** for a new truck that costs RM 60,000 and has a salvage value of RM 10,000 at the end of five years. (15 marks)
- Total: [25 marks]
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2. a) The following Table 1 shows the prices and quantities of three basic ingredient (Roasted Tea Leaves, Milk and Brown Sugar) used in the making of a brown sugar milk tea for the year 2024 and 2025.

Table 1

Base Year 2024 Ingredient	Price (RM)		Quantity (kg)	
	2024	2025	2024	2025
Roasted Tea Leaves	120.00	122.00	77	88
Milk	88.00	91.00	90	99
Brown Sugar	90.00	88.00	140	150

Compute the following index for year 2025:

- i) Relatives price index for Milk and Brown Sugar. (6 marks)
 - ii) Simple aggregate price index. (4 marks)
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- b) Based on the following linear programming. Sketch the **feasible region** of linear function using graphic method.

Maximize

$$25x + 30y$$

Subject to:

$$20x + 15y \leq 1\,200$$

$$8x + 12y \leq 600$$

$$x \leq 50$$

$$x, y \geq 0$$

(15 marks)
Total: [25 marks]

3. The following table shows the price (RM per unit) and quantity (units) of four types of detergents sold by a retail store in the years 2022, 2023, and 2024.

Type of Detergent	Price (2022)	Quantity (2022)	Price (2023)	Quantity (2023)	Price (2024)	Quantity (2024)
Breeze	RM 10.00	120	RM 11.00	140	RM 12.00	160
Dynamo	RM 9.00	100	RM 10.00	110	RM 11.50	125
Fab	RM 7.00	90	RM 7.50	85	RM 8.00	100
Top	RM 8.00	95	RM 8.50	105	RM 9.00	120

- a) Calculate the Paasche Price Index for both 2023 and 2024, using 2022 as the base year. (20 marks)
- b) Based on **Q3(a)**, calculate the Value Index for the years 2024, using 2022 as the base year. (5 marks)
Total: [25 marks]
4. a) Mobile Legend (ML) Manufacturing produces smart study desks that sell for RM1,200 per unit. The variable cost per unit is RM450, and the company's fixed monthly costs of RM22,500.
- i) If ML Manufacturing **increases** its selling price by 8% (variable cost remains unchanged), calculate the new break-even point in units. (6 marks)
- ii) If ML Manufacturing **reduces** its variable cost by RM150 per unit (selling price remains unchanged), calculate the new break-even point in units and in Ringgit (RM). (9 marks)
- b) Joyo Company is considering several alternatives development projects. The financial success of the project depends on the interest rate movements in the next four years. The projects and their four-year financial returns (RM in millions) with the possible given interest rates decline, remain stable, or increase are shown in the Table 2 below.

Table 2

Project	Interest Rate, Return (RM in millions)		
	Decline	Stable	Increase
Shop	36	22	15
Mall	53	39	25
Condominium	35	17	4
Warehouse	16	15	10

Based on the following criterion, determine the investment:

- i) Maximax Criterion (5 marks)
- ii) Maximin Criterion (5 marks)
Total: [25 marks]

- END OF QUESTIONS -

FORMULAE LIST

Financial Mathematics

$$S_n = \frac{n}{2}[2a + (n - 1)d]$$

$$T_n = a_1 + (n - 1)d$$

$$\text{Term} = T_n = ar^{n-1}$$

$$\text{Sum of infinity, } S_\infty = \frac{a}{1 - r}$$

$$\text{Annual Depreciation} = \frac{C - \text{Salvage Value}}{\text{Useful Life}}$$

$$\text{Depreciation Rate, } r = \frac{100}{\text{Useful life}}$$

$$\text{Accumulates depreciation} = \text{Annual depreciation} \times \text{Numbers of years}$$

$$\text{Book Value, } BV = \text{Cost} - \text{Accumulated Depreciation}$$

$$\text{Book Value, } BV = C(1 - r)^n$$

$$\text{Interest, } I = Prt$$

$$\text{Simple interest, } A = P(1 + rt)$$

$$\text{Compounded Amount, } A = P\left(1 + \frac{r}{n}\right)^{nt}$$

Times Series

$$b = \frac{\sum tY - \sum Y\left(\frac{\sum t}{n}\right)}{\sum t^2 - \frac{(\sum t)^2}{n}}$$

$$a = \frac{\sum Y}{n} - b\left(\frac{\sum t}{n}\right)$$

Break Even Analysis

$$\text{Total Revenue, } TR = P \times Q$$

$$\text{Total Cost, } TC = FC + VC$$

$$\text{Contribution Margin, } CM = P - VC$$

$$\text{Contribution Margin Ratio, } CMR = \frac{P - VC}{P} \times 100\%$$

$$\text{Break - even Point, } BEP(\text{Unit}) = \frac{FC}{CM}$$

$$\text{Break - even Point, } BEP(\text{Price}) = \frac{FC}{CMR} = BEP(\text{unit}) \times P$$

$$\text{Profit} = TR - TC$$

Index Number

$$\text{Price Index, } I = \frac{P_1}{P_0} \times 100$$

$$\text{Average of Price Index} = \frac{\sum \frac{P_1}{P_0} \times 100}{k}$$

$$\text{Aggregate of Price Index} = \frac{\sum P_1}{\sum P_0} \times 100$$

$$\text{Quantity Index, } I = \frac{q_1}{q_0} \times 100$$

$$\text{Average of Quantity Index, } I = \frac{\sum \frac{q_1}{q_0} \times 100}{k}$$

$$\text{Aggregate of Quantity Index} = \frac{\sum q_1}{\sum q_0} \times 100$$

$$\text{Paasche's index} = \frac{\sum P_1 Q_1}{\sum P_0 Q_1} \times 100$$

$$\text{Laspeyres's index} = \frac{\sum P_1 Q_0}{\sum P_0 Q_0} \times 100$$

- END OF FORMULAE LIST -