PENINSULA COLLEGE GEORGETOWN DK266-03(P)

FINAL EXAMINATION

Semester	:	**SEPTEMBER 2025 SEMESTER**
Programme Name	:	**CERTIFICATE IN BUSINESS STUDIES**
Course Code & Name	:	**CBS1034 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 6 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) List the following expression using the the order of operations (PEMDAS) in the correct sequence:

$$50 - (3^2 + 4 \times 2) \div 17 + [5 \times (10 - 8)]$$

(4 marks)

b) Define the term 'Ratio'. (2 marks)

c) State the formula used to calculate Percentage Increase. (2 marks)

d) Convert the following linear equation into the slope-intercept form $(y = mx + c)$.

i) $x + 1 = 2(y + 2)$ (3 marks)

ii) $3x + 3y - 15 = 0$ (3 marks)

iii) $4y - 1 = 3(x + 3)$ (3 marks)

iv) $x = \frac{y - 2}{8}$ (3 marks)

e) Ms. Tham invest RM 12,000 in a new saving fund that offers an interest rate of 8.3% per annum. Apply the compound interest formula to calculate the total future amount in her Account after 3 years, assuming the interest is compounded semi-annually. (5 marks)

Total: [25 marks]

2. a) For a restaurant business, identify **THREE (3)** examples of fixed costs and **THREE (3)** examples of variable costs. (6 marks)

b) A manager is choosing between two production lines, 'Alpha' and 'Beta', to meet an annual order of 4,000 units. The selling price per unit is fixed at RM 450.

- **Line Alpha** has annual fixed costs of RM 150,000, shipping of RM 120 per unit, and production costs of RM 200 per unit.
- **Line Beta** has annual fixed costs of RM 120,000, shipping of RM 140 per unit, and production costs of RM 240 per unit.

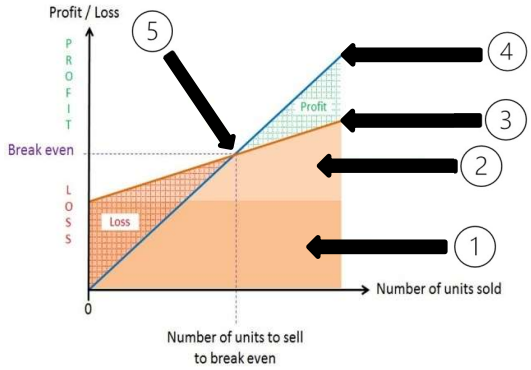
i) Calculate the total sales revenue. (2 marks)

ii) Calculate the total cost for both production lines. (6 marks)

2. b) iii) Determine the profit or loss for both production lines. (4 marks)

iv) Justify your decision on which production line is the best to use. (2 marks)

c) Identify the components labelled 1 to 5 in the provided break-even analysis chart. (5 marks)



Total: [25 marks]

3. a) The following table shows the average price (RM) of four electronic components in 2023 and 2024.

Type of Electric Component	Price (2023)	Price (2024)
Resistor	RM 10.00	RM 12.00
Diode	RM 20.00	RM 25.00
Capacitor	RM 18.00	RM 15.00
Transistor	RM 8.00	RM 9.00

i) Using 2023 as the base year, find the simple aggregate price index for the components. (4 marks)

ii) Using 2023 as the base year, compute the price relative (Unweighted Price Index) for each component. (8 marks)

iii) From your answers in **Q3a) (ii)**, determine the average of the relative price index. (3 marks)

3. b) The market tracked its sales (in kg) for three meat types for 2024 and 2025. Using 2024 as the base year, they also calculated the relative quantity index.

Meat Types	Sales (2024)	Sales (2025)	Relative Quantity Index
Red Meat	545 kg	**B**	110.25 %
Poultry	988 kg	955 kg	**C**
Seafood	**A**	400 kg	109.59 %

i) Calculate the missing values **A, B, and C** in the table. (6 marks)

ii) Using the completed data, compute the simple aggregate quantity index for 2025, using 2024 as the base. (4 marks)

Total: [25 marks]

4. a) Explain the meaning of book value. (2 marks)

b) A delivery van is purchased for RM 25,000. It is expected to last 4 years and have a resale value of RM 5,000. Using the straight-line method, construct a full depreciation schedule (from Year 0 to Year 4) using the following format:

Year	Annual Depreciation (RM)	Depreciation to date (RM)	Book Value, end year (RM)
0	0	**0**	
1			
2			
3			
4			

(13 marks)

c) Apply the declining-balance method to solve the missing values (P, Q, R, S, and T) based on the following three separate scenarios.

$$Book\ Value = Original\ Cost\ (1 - rate)^n$$

i) Scenario 1: An asset is purchased for an original cost of RM 10,000. Using a depreciation rate of 10%, find its Book Value (P) and its Accumulated (4 marks)

ii) Scenario 2: An asset is depreciated using an 8% rate. At the end of the 3 years, its book value is RM 4,500. Calculate the asset's original Cost (R) and the Accumulated Depreciation (S). (4 marks)

iii) Scenario 3: An asset with an original cost of RM 15,000 has an accumulated depreciation of RM 2,782, with 4 years of useful life, determine the Depreciation Rate (T) that was used, expressed as a percentage with its book value is RM12,218. (2 marks)

Total: [25 marks]

- END OF QUESTIONS -

FORMULAE LIST

Financial Mathematics

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

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

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

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

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

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

$$Accumulates\ depreciation = Annual\ depreciation\ \times Numbers\ of\ years$$

$$Book\ Value, BV = Cost - Accumulated\ Depreciation$$

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

$$Interest, I = Prt$$

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

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

Break Even Analysis

$$Total\ Revenue, TR = P \times Q$$

$$Total\ Cost, TC = FC + VC$$

$$Contribution\ Margin, CM = P - VC$$

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

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

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

$$Profit = TR - TC$$

Index Number

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

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

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

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

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

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

- END OF FORMULAE LIST -