



FINAL SEMESTER EXAMINATION

Student NRIC : _____
Student ID : _____

Programme	:	DIPLOMA OF ACCOUNTANCY (MQA/FA10069) DIPLOMA IN LOGISTICS MANAGEMENT (MQA/FA9212)
Intake	:	JUNE/SEPT 21
Course	:	BUSINESS MATHEMATICS
Course Code	:	DBMT3013
Duration	:	3 hours

INSTRUCTIONS TO CANDIDATES:

1. Please read the instructions given in the question paper **CAREFULLY**.
2. This 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 and graph paper provided.
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 the accordance with the clauses stipulated in the Students' Handbook, up to and including expulsion from Peninsula College Georgetown.

(This booklet contains 7 printed pages including this page)

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

For examiner's use only

QUESTION NO.	MARKS
1	/ 25
2	/ 25
3	/ 25
4	/ 25
Total	/ 100

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

[100 marks]

1. a) A progression is given as 6 18 30 ...

Identify the progression and compute T_{20} and S_{15} .

(8 marks)

- b) A progression is given as 243 81 27 ...

- i. Compute T_{10} , correct to 5 decimal places.

(3 marks)

- ii. Compute S_{12} , correct to 5 decimal places.

(3 marks)

- iii. Compute S_{∞} .

(3 marks)

- iv. Explain the reason why the answers in part b) ii) and part b) iii) are almost equal.

(2 marks)

- c) James has a saving of RM15,000 in a bank that pays annual interest of 6%. If the bank offers compound interest half yearly for 5 years, calculate the amount that James has at the end of 5 years.

(6 marks)

Total: [25 marks]

2. a) The prices per kilogram of vegetables for the years 2016 – 2019 were as follows:

Type of vegetables	Price in RM in 2016	Price in RM in 2019
Cabbage	3.00	4.20
Sawi	2.60	3.40
Celery	5.20	6.80

Required:

- i. Compute the average relative price index using 2016 as base year. Interpret the result.

(5 marks)

- ii. Compute the aggregate price index for the vegetables above.

(4 marks)

- b) Determine the Laspeyres price index for the following group of imported fruits.

Imported fruits	Price (RM per kilogram)		Quantity (kilograms)	
	2019	2020	2019	2020
Grapes	9.00	10.20	300	380
Chinese oranges	3.00	3.80	2000	2500
Blue berry	10.60	14.20	100	200

(6 marks)

c) Determine the Paasche price index for the list of imported fruits in b) above.
(6 marks)

d) Explain the reason why most of the researchers prefer to use Laspeyres index rather than Paasche.

(4 marks)

Total: [25 marks]

3. a) A factory produces white and dark chocolate. The ingredients for both the products are shown in the table below:

Type of chocolate		
	Ingredients in kg	
White		
Dark		

	Coco powder	Milk powder
White	5	30
Dark	25	10

The factory has 175 kg of coco powder and 350 kg of milk powder. For each kilogram of white chocolate and dark chocolate, the factory intends to earn a profit of RM20 and RM35 respectively.

Let x_1 be the amount of white chocolate produced and x_2 be the amount of dark chocolate produced.

Required:

i. Formulate two equations in x_1 and x_2 using the information above.
(6 marks)

ii. Construct the objective function, $P(x)$, for the profit to be achieved.
(2 marks)

b) Construct a graph for the two (2) equations in (a)(i) above.
(10 marks)

c) Identify a point from the graph and compute the maximum profit for the production of the chocolates.
(3 marks)

d) Rewrite and simplify the equations in (a)(i) and together with the objective function, write the equations into a simplex matrix.
(4 marks)

Total: [25 marks]

4. a) The sales of a textile company from 2002 to 2018 are recorded below.

Year	2002	2003	2004	2005	2006	2007
Sales(RM mill)	5	6	8	10	5	3
Year	2008	2009	2010	2011	2012	2013
Sales(RM mill)	7	10	12	11	9	13
Year	2014	2015	2016	2017	2018	
Sales(RM mill)	15	18	15	11	14	

Required:

- i. Construct a 5-year moving average table as shown below and complete it.

Year	Sales (RM millions)	5-year moving total	5-year moving average
2002	5		
2003	6		
2004	8		
2005	10		
2006	5		
2007	3		
2008	7		
2009	10		
2010	12		
2011	11		
2012	9		
2013	13		
2014	15		
2015	18		
2016	15		
2017	11		
2018	14		

(10 marks)

- ii. Plot the graph for the sales from 2002 to 2018 that include the 5-year moving average trend line.

(10 marks)

- b) Construct a similar 7-year moving average table from year 2002 to 2018 using the values above.

(5 marks)

Total: [25 marks]

- END OF QUESTIONS -

APPENDIX

List of Formulas for BM

A.P

The n^{th} term $T_n = a + (n - 1)d$

The sum of first n terms $S_n = \frac{n}{2}[2a + (n - 1)d]$

G.P.

The n^{th} term $T_n = a(r^{n-1}) = ar^{n-1}$

The sum of first n terms $S_n = \frac{a(r^n - 1)}{r - 1}$

$$S_n = \frac{a(1 - r^n)}{1 - r} \quad \text{for } r < 1$$

S_∞ is Sum to infinity. $S_\infty = \frac{a}{1 - r}$

Interest

$I = P r t$ this is used to find simple interest

Simple amount, $S = P(1 + rt)$

Compound Interest, $S = P(1 + i)^n$

List of Formulas for BM

Depreciation

(i) **Straight line method:**

$$\text{Annual depreciation} = \frac{\text{Cost-Salvage value}}{\text{Useful life}}$$

$$\text{Annual rate of depreciation} = \frac{100\%}{\text{Useful life}}$$

(ii) **Declining Balance Method:**

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

Break Even Analysis

(i) In terms of quantity (units) $\text{BEP (units)} = \frac{FC}{p-VC}$

(ii) In terms of value $\text{BEP (RM)} = \frac{FC}{\frac{p-VC}{p}} = \frac{FC}{p-VC} \times p$

(iii) Total revenue (TR) = Price per unit x Quantity sold

(iv) Total cost (TC) = Fixed cost + Variable cost

(v) Profit = TR – TC