UNIVERSITI KUALA LUMPUR
MALAYSIA ITALY DESIGN INSTITUTE

FINAL EXAMINATION

MARCH 2026 SEMESTER

COURSE CODE	:	PPB 10203
COURSE TITLE	:	BUSINESS MATHEMATICS
PROGRAMME NAME	:	BACHELOR OF TECHNOLOGY MANAGEMENT (HONOURS)
DATE	:	25 JUNE 2026
TIME	:	9:00AM - 11:30AM
DURATION	:	2 HOURS 30 MINUTES

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 consist of TWO sections.
4. Answer ALL questions for Section A.
5. Section B consist of four questions. Answer THREE (3) questions only.
6. Please write your answer on the answer booklet provided.
7. Please answer all questions in English only.
8. Please answer MCQ/EMQ questions using OMR sheet. ☐ *Tick if applicable*
9. Refer to the attached Formula/ Appendies. ☐ *Tick if applicable*

SECTION A (Total: 40 marks)

Answer ALL questions.

Please use the answer booklet provided.

Question 1

Answer the following questions :

(a) The sum of the first 15 terms of an arithmetic sequence is 120, and the sum of the first 25 terms is 150. Determine the first term, ***a*** and common difference, ***d*** of the sequence.

(5 marks)

(b) Determine the value of x and y that satisfies the following equation by using the **elimination** method.

$$\begin{aligned} 5x + y &= 22 \\ 2x - y &= 6 \end{aligned}$$

(5 marks)

Question 2

Answer the following questions :

(a) By using a quadratic formula, solve the quadratic equation $2x + 1 = x^2$. Give your answer up to **two decimal places**.

(6 marks)

(b) Solve the value of ***v*** given that $\frac{3v + 4}{8} = \frac{2v - 1}{5}$.

(4 marks)

Question 3

The data related to a tote bag produced by Luna Luxe Enterprise for the year 2024 is shown below:

Sales Volume : 2500 units
Selling price : RM 35.00 per unit
Variable Cost : RM 12.80 per unit
Fixed Cost (annually) : RM 18,500.00

(a) Calculate the profit gained by Luna Luxe Enterprise.

(4 marks)

(b) Calculate the break-even point in units and RM.

(6 marks)

Question 4

A cost of a Men's Batik Shirt at Aryan's Attire is RM 210 per unit. If the seller wants a 25% markup based on the retail price, find:

(a) the retail price.

(4 marks)

(b) the profit (per unit).

(2 marks)

(c) the price after discount to 35% during sales.

(4 marks)

SECTION B (Total: 60 marks)

Answer THREE (3) questions only.

Please use the answer booklet provided.

Question 1

Answer the following questions :

(a) Alicia purchased 40 units of electric bicycles at a cost price of RM 1,500 per unit. She plans to sell them to eco-friendly resorts.

i. Calculate the selling price per unit if she wants a 35% markup based on the overall retail price.

(6 marks)

ii. A competing supplier offers a 15% markdown, reducing their retail price to RM 1,870. Calculate the original retail price before the markdown.

(5 marks)

(b) A furniture wholesaler made a net profit of 28% based on cost when she sold a dining table set for RM 2,600, with operating expenses amounting to 15% of the cost. Calculate:

i. the cost of the dining table set.

(3 marks)

ii. the breakeven price of the dining table set.

(2 marks)

iii. the net profit earned from the sale.

(2 marks)

iv. the new retail price if the wholesaler offers a 15% discount to the early buyers.

(2 marks)

Question 2

Answer the following questions :

(a) EcoGlow Malaysia is introducing a new organic shampoo. The production and finance departments provided the following cost details:

- Rent and Utilities = RM 20,000
- Branding & Marketing = RM 10,000
- Certification Fees = RM 3,000
- Other Fixed Costs = RM 9,500
- Ingredients (for 6,000 units) = RM 18,000
- Other Variable Costs (per unit) = RM 2.50
- Selling Price per Unit = RM 17.00

Using the information above, calculate:

i. the profit if 6,500 units are sold.

(6 marks)

ii. the change in profit if fixed costs and variable costs are reduced by 10% and 5% respectively.

(6 marks)

(b) Find the period from 3 April 2024 to 28 Aug 2024 using :

i. the exact time.

(2 marks)

ii. the approximate time.

(2 marks)

(c) Find the interest earned on an investment of RM 6,500 after 3 years at an interest rate of 7% per annum, using simple interest.

(4 marks)

Question 3

Answer the following questions :

(a) Faiz invested RM 4,000 into a savings account for 2.5 years. At the end of the investment period, he earned RM 600 in simple interest. Find the annual interest rate.

(3 marks)

(b) Ms. Aisha is deciding where to place her RM 50,000 savings. She is comparing two fixed deposit options:

- **Bank ABC:** 6.8% annual interest rate compounded semi-annually
- **Bank XYZ:** 6.6% annual interest rate compounded monthly

i. Determine which bank provides a better effective annual return.

(7 marks)

ii. Find the future value of this investment if Ms. Aisha invests for 4 years with the better option.

(4 marks)

(c) Jamal deposited RM 10,000 into a savings account that offers 6% interest per annum compounded quarterly. After 1 year, he added an extra RM 3,000 to the account. Find the total amount in the account 4 years after the initial deposit.

(6 marks)

Question 4

Answer the following questions :

(a) Aina invested a sum of money at an interest rate of 5.5% compounded monthly. After 3 years, the accumulated amount in her account is RM 6,432.20. Find the interest earned on her investment.

i. Calculate the monthly interest rate and the number of compounding periods.

(4 marks)

ii. Calculate the initial investment (principal).

(4 marks)

iii. Calculate the interest earned on the investment.

(2 marks)

(b) Daniel deposited RM 18,000 into a fixed deposit account that earns 6.2% interest compounded quarterly. After 1.5 years, he withdrew RM 5,000. Find the remaining amount in his account.

i. Calculate the monthly interest rate and the number of compounding periods.

(4 marks)

ii. Calculate the total amount in the account before withdrawal.

(4 marks)

iii. Calculate the interest earned during the investment.

(2 marks)

END OF EXAMINATION PAPER

APPENDIX

LIST OF FORMULAS FOR BUSINESS MATHEMATICS

I	ARITHMETIC SEQUENCE	II	GEOMETRIC SEQUENCE
1.	***n*th Term:** $T_n = a + (n-1)d$	1.	***n*th Term:** $T_n = ar^{n-1}$
2.	**Sum:** $S_n = \frac{n}{2}[2a + (n-1)d]$	2.	**Sum:** $S_n = \frac{a(r^n-1)}{r-1}$ $if\ r > 1$ **Sum:** $S_n = \frac{a(1-r^n)}{1-r}$ $if\ r < 1$
III	**MARKUP & MARKDOWN**		
1.	**Markup:** $R = C + M \Rightarrow M = R - C$	2.	**Markdown:** $MD = OP - NP$
	$R = Retail\ Price$ $C = Cost\ Price$ $M = Markup\ (or\ Gross\ Profit)$		$MD = Markdown$ $OP = Old\ Retail\ Price$ $NP = New\ Retail\ Price$
3.	**Markup Percent Based on Retail Price:** $\%M_r = \frac{M}{R} \times 100\%$	4.	**Markdown Percent Based on Retail Price:** $\%MD = \frac{MD}{OP} \times 100\%$
5.	**Breakeven Price:** $BEP = C + OE$	6.	**Retail Price:** $R = C + NP + OE$
	$BEP = Breakeven\ Price$ $C = Cost\ Price$ $OE = Operating\ Expenses$		$C = Cost\ Price$ $NP = Net\ Profit$ $OE = Operating\ Expenses$
IV	**SIMPLE INTEREST**	V	**COMPOUND INTEREST**
1.	**Interest:** $I = Prt$	1.	**Effective Rate:** $r_{eff} = \left(1 + \frac{r}{m}\right)^m - 1$
2.	**Simple Amount:** $S = P(1 + rt)$	2.	**Compound Amount:** $S = P(1 + i)^n$
3.	**Present Value:** $P = S(1 + rt)^{-1}$	3.	**Present Value:** $P = S(1 + i)^{-n}$
			where: $i = \frac{r}{m}$ and $n = m \times t$