UNIVERSITI KUALA LUMPUR
Malaysian Institute of Marine Engineering Technology

FINAL EXAMINATION

JULY 2025 SEMESTER SESSION (7-WEEK)

SUBJECT CODE	:	**LOD10503**
SUBJECT TITLE	:	**BUSINESS MATHEMATICS**
PROGRAMME NAME (FOR MPU: PROGRAMME LEVEL)	:	**DIPLOMA IN MARITIME MANAGEMENT**
TIME / DURATION	:	**9.00 AM - 12.00 PM** **(3 HOURS)**
DATE	:	**18 SEPTEMBER 2025**

INSTRUCTIONS TO CANDIDATES

1. Please read **CAREFULLY** the instructions given in the question paper.

2. This question paper has information printed on both sides of the paper.

3. This question paper consists of **TWO (2)** sections; Section A and Section B.

4. Answer **ALL** question in Section A, and **TWO (2)** questions **ONLY** for Section B.

5. Please write your answers on this answer booklet provided.

6. Answer **ALL** questions in English language **ONLY**.

7. The list of formula is included in the appendix for reference.

THERE ARE 5 PAGES OF QUESTIONS, EXCLUDING THIS COVER PAGE.

SECTION A (Total: 60 marks)

INSTRUCTION: Answer ALL questions.
Please use the answer booklet provided.

Question 1

(a)   Solve the equation to find the value of x.

$$2 + 2(6 + 3x) = 3(-x + 4)$$

(3 marks)

(b)   Solve the following simultaneous equations by using elimination method to find the value of x and y.

$$5x + y = 12$$
$$6x + 5y = 40$$

(7 marks)

Question 2

On 2nd November 2023, Farahin, a logistics officer, invested RM8,000 in a maritime cooperative's savings plan that follows Banker's Rule, offering an annual interest rate of 5.5%. She withdrew the deposit on 2nd March 2024.

(a)   State the definition of Banker's Rule in simple interest calculation in term of time.

(2 marks)

(b)   Find the number of days the deposit was kept.

(3 marks)

(c)   Calculate the accumulated amount in the account using the Banker's Rule.

(3 marks)

(d)   Hence, find the interest she earned using the Banker's Rule.

(2 marks)

Question 3

(a)   State the difference between effective rate and nominal rate.

(2 marks)

(b)   Find the effective rate that is equivalent to 25% compounded quarterly.

(2 marks)

(c)   RM5,500 is deposited into an account with the interest rate for the savings account is 5.5% compounded semi-annually for the first 3 years, and 7% compounded quarterly for the rest of the term. At the beginning of the 4th year, he adds an additional RM2,000 into the account. Calculate the amount in the savings account at the end of the 10th year.

(6 marks)

Question 4

A marine supply store received an invoice for their purchase dated 20th February 2024 amounting to RM7,500 including transportation charges of RM100. The company was given a chain discount of 10%, 8% and 5% and cash terms of 3/15, 1/20, n/30.

(a)   State one reason why trade and cash discounts are given by manufacturers to retailers.

(2 marks)

(b)   Find the single equivalent discount rate (SEDR) to 10%, 8% and 5% trade discount.

(2 marks)

(c)   Hence, using SEDR from (b), compare the net payment if the invoice is paid on:
   i.   4th March 2024

(3 marks)

   ii.   12th March 2024

(3 marks)

Question 5

A company purchased an item for RM2,000. The item was sold for a net profit of 15% of the retail price. If the overhead was 10% based on cost, find:

(a)   the retail price.

(3 marks)

(b)   the gross profit.

(3 marks)

(c)   the breakeven price.

(2 marks)

(d)   the maximum markdown rate without incurring loss.

(2 marks)

Question 6

A worker bought a car through an installment plan which cost RM55,000 cash. The downpayment is 10% of the cash price and the balance will be settled through 60 monthly payments. The interest charged was 3% based on the original balance. Estimate:

(a)   the total interest charged .

(4 marks)

(b)   the installment price.

(3 marks)

(c)   the monthly payment.

(3 marks)

SECTION B (Total: 40 marks)

INSTRUCTION: Answer only TWO questions ONLY.
Please use the answer booklet provided.

Question 7

(a)   A factory bought machinery listed at a price of RM25,000 including the transportation cost of RM500. The manufacturer offered a trade discount of 10%, 8% and 5%. Find:

   i.   the total payment

(4 marks)

   ii.   the trade discount

(2 marks)

   iii.   the single equivalent discount rate (SEDR)

(2 marks)

   iv.   the net price using the single equivalent discount rate (SEDR) from (iii).

(2 marks)

(b)   Mutiara Sdn. Bhd. bought 10 computer sets and paid RM2,000 as a downpayment. The balance was to be paid by monthly payments of RM1,650 for two years. The interest rate charge was 10% per annum based on the original balance.

   i.   Find the total installment price the company paid for all 10 computer sets.

(3 marks)

   ii.   Calculate the cash price of one computer set.

(4 marks)

   iii.   Determine the amount the company must pay immediately after the 12th payment using Rule of 78 if he decides to settle all the outstanding debts.

(3 marks)

Question 8

(a)   A loan of RM5,700 matures in 2 years;   RM4,000 in 4 years' time and another RM10,000 in 6 years. All loans are to be settled by making two equal payments, one in the 3rd year, and another in the 7th year. Determine the equal payment assuming that money is worth 6% compounded semi-annually.

(Hint: Use current year as focal date.)

(10 marks)

(b)   A worker bought a car at the cost of RM42,000. It is expected to last for six years and has a salvage value of RM6,000. Using straight line method, calculate the book values of the machine each year in a depreciation table.

(10 marks)

Question 9

(a)   A company purchased 100 handbags and paid a total cost of RM19,000. The company plans to sell the handbags by making 15% net profit based on retail price, and the operating expenses were 10% based on cost. Calculate:

i.   the retail price of each handbag.

(4 marks)

ii.   the total operating expenses incurred by the company.

(2 marks)

iii.   the gross profit obtained from each handbag.

(2 marks)

iv.   the percentage of markdown if each handbag was sold at its breakeven price.

(2 marks)

(b)   Sofia invested RM5,000 into an account that paid 5% compounded semi-annually. She intended to keep the account untouched, however, after four years, she withdrew RM1,000 from the account.

i.   Determine the amount left in the account six years after the withdrawal.

(7 marks)

ii.   Find the effective rate which is equivalent to the nominal rate.

(3 marks)

END OF EXAMINATION PAPER

APPENDIX

LIST OF FORMULA

Simple Interest	Markup and Markdown
$S = P(1 + rt)$	$RP = C + M$
$H = S(1 - dt)$	$M = OE + NPf$
$r = \dfrac{d}{1 - dt}$	Installment Purchase
$d = \dfrac{r}{1 + rt}$	$IP = CP + I$
Compound Interest	$I = Brt$
$S = P(1 + i)^n$	$R = \dfrac{R_n}{n}$
$i = \dfrac{k}{m}$	$I = \dfrac{rB(n + 1)}{2m}$
$n = m \times t$	$OPB = Rk - I\left(\dfrac{k(k + 1)}{n(n + 1)}\right)$
Trade and Cash Discount	Depreciation
$TD = LP \times d$	$AD = \dfrac{TD}{n}$
$NP = LP(1 - d_1)(1 - d_2) \dots (1 - d_3)$	$r = \dfrac{1}{n} \times 100\%$
$SEDR = 1 - [(1 - d_1)(1 - d_2) \dots (1 - d_3)]$	$S = C(1 - r)^n$
$Credit = \dfrac{Partial\ Payment}{1 - cd}$	$r = 1 - \sqrt[n]{\dfrac{S}{C}}$
$Outstanding\ amount = LP - credit$	$Sum = \dfrac{n(n + 1)}{2}$