**CONFIDENTIAL**

KOLEJ POLY-TECH MARA

# FINAL EXAMINATION

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| **COURSE** | **:** | **BUSINESS MATHEMATICS** |
| **COURSE CODE** | **:** | **TBM1063** |
| **DURATION** | **:** | **2 HOURS** |

**INSTRUCTIONS TO CANDIDATES** :

1. This question paper consists of **TEN (10)** questions.

2. Answer ALL questions in the Answer Booklet provided.

3. Please check to make sure that this examination pack consists of:
   i. The Question Paper
   ii. An Answer Booklet
   iii. A Graph paper
   iv. Appendix 1

4. Do not bring any material into the examination hall unless permission is given by the invigilator.

5. Please write your answer using a ball-point pen.

6. Electronic calculator is allowed.

**MYKAD NO :** _____

**ID. NO. :** _____

**LECTURER :** _____

**SECTION :** _____

**DO NOT OPEN THIS QUESTION PAPER UNTIL YOU ARE TOLD TO DO SO**

*The question paper consists of 3 printed pages.*

**Short Answer**

1. **(20 points)**
   a. Shade the region that satisfies the given inequalities.

      i. $y \geq -5$ (2 points)

      ii. $y \leq 2x - 7$ (3 points)

   b. Umairah Construction has two branches located at Kajang and Shah Alam. Each branch produces three types of brick: Clay brick, Engineering brick, and Concrete brick. Each branch must produce at least 8,500, 1,550, and 450 pieces daily of these three types of brick, respectively. The number of bricks per day and the operating costs are shown in Table 1 below:

| **Brick** | **Kajang** | **Shah Alam** | **Daily requirement** |
|---|---|---|---|
| Clay | 100 | 50 | 8,500 |
| Engineering | 10 | 10 | 1,550 |
| Concrete | 2 | 9 | 450 |
| **Operating Cost** | RM750 | RM900 | |

Table 1

By using the linear programming model,

i. write the objective function, C. (1 point)

ii. write the problem constraints and non-negative constraints. (4 points)

iii. graph the feasible region. (5 points)

iv. determine the minimum cost and specify the number of bricks that should be produced in each branch to minimize the cost. (5 points)

2. **(2 points)**
   Amy took a loan of RM6,000 at a 5% simple interest rate for three years. How much interest was charged?

3. **(5 points)**
   On 5th March 2023, Sally borrowed RM3,500 from a bank and was charged 5.5% simple interest. She paid the loan on 24th June 2023. Find

   a. the period of the loan (in days)? (2 points)

   b. the amount she has to pay? (3 points)

4. **(3 points)**
Aqilah invested RM 10,000 in an investment firm for 5 years. At the end of the period, her total investment amounted to RM12,250. Find the rate of the simple interest, *r*.

5. **(3 points)**
Rajoo invested RM12,000 for 15 years. If the money is 5% compounded quarterly, what is the accumulated amount?

6. **(3 points)**
If Zaha invests RM *p* at 3.5% compounded monthly for twenty years, what is the value *p* if the accumulated amount at the end of investment period is RM50,000.

7. **(4 points)**
Siew Peng wishes to invest some money to purchase a gold necklace. She has received two different quotes from two banks:

Bank P : 3.75% compounded semi-annually
Bank Q : 3.55% compounded quarterly

Which bank offers a better deal?

8. **(3 points)**
Abdullah has to pay RM750 every month for 36 months to settle a loan with a 9% compounded monthly. What is the original value of the loan?

9. **(3 points)**
David deposited RM500 at the end of every 6 months for the next 8 years and he was offered 5% compounded semi-anually. How much money will be in his account at the end of the investment period?

10. **(4 points)**
Shamsul buys an apartment for RM465,000. Suppose he pays a 15% down payment with the balance to be amortized in a 30 years mortgage at an annual rate of 4.5% compounded monthly. Calculate the monthly payment.

**END OF QUESTION PAPER**

## APPENDIX 1

## LIST OF FORMULA

1. $S = P(1+rt)$

2. $I = \Pr t$ , $S = P + I$

3. $S = P(1+i)^n$

4. $r = \left(1+\frac{k}{m}\right)^m - 1$

5. $S = R\left[\frac{(1+i)^n - 1}{i}\right]$ , $I = S - Rn$

6. $A = R\left[\frac{1-(1+i)^{-n}}{i}\right]$ , $I = Rn - A$