FACULTY OF INDUSTRIAL SCIENCES & TECHNOLOGY

FINAL EXAMINATION

COURSE	**:**	**MATHEMATICS FOR MANAGEMENT**
COURSE CODE	**:**	**BUM1123**
DURATION	**:**	**3 HOURS**

INSTRUCTIONS TO CANDIDATES:

1. This question paper consists of **EIGHT (8)** questions. Answer **ALL** questions.
2. All answers to a new question should start on a new page.
3. All the calculations and assumptions must be clearly stated.

EXAMINATION REQUIREMENTS

1. Scientific Calculator
2. **APPENDIX**

DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO

This examination paper consists of **SEVEN (7)** printed pages including front page.

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QUESTION 1

Given the following functions

$$f(x) = x^2 - 3 \text{ and } g(x) = 5x.$$

Find

(i) $(g \cdot f)\left(\frac{1}{5}\right)$

(4 Marks)

(ii) $\left(\frac{f}{g}\right)(2)$

(4 Marks)

(iii) $(f \circ g)(-3)$

(4 Marks)

QUESTION 2

Solve the following system of linear equations using elementary row operations

$$\begin{aligned} x + y + z &= 3 \\ 2x + 3y + 7z &= 0 \\ x + 3y - 2z &= 17. \end{aligned}$$

(11 Marks)

QUESTION 3

(a) Solve the rational inequality,

$$\frac{x^2 + 2x - 8}{x + 2} > 0.$$

(6 Marks)

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(b) Given the following inequalities,

$$\begin{aligned} -3x + 4y &\le 18 \\ 2x + y &\ge 10 \\ x + y &\le 15 \\ x &\ge 0 \\ y &\ge 0 \end{aligned}$$

(i) Sketch a graph for the inequalities.

(5 Marks)

(ii) Locate the solution region.

(1 Mark)

QUESTION 4

Solve the following equations.

(a) $2\left(3^{2t-5}\right) - 4 = 11$

(5 Marks)

(b) $\log 5x + \log\left(x - 1\right) = 2$

(5 Marks)

QUESTION 5

Anita borrows RM 5,000 on 14 July 2015 at 12% simple interest and the loan is paid on 12 September 2015. Find the interest and calculate the total amount paid under each of the two methods of computing time and interest.

(i) Approximate time, ordinary interest.

(6 Marks)

(ii) Exact time, exact interest.

(6 Marks)

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QUESTION 6

(a) Mrs. Fatimah deposited RM 3,000 into a savings account that earned 12% interest compounded quarterly. How long would it take for the investment to become RM 3,582.16?

(6 Marks)

(b) On 22 February 2015, Siti received a 90-day promissory note with a simple interest rate of 8% per annum. On 13 April 2015, she discounts the note at 7%. The proceeds she receives are RM 9,108.60. Find

(i) the maturity date of the note.

(2 Marks)

(ii) the maturity value of the note.

(4 Marks)

(iii) the face value of the note.

(2 Marks)

(iv) the simple interest rate earned by the bank which is equivalent to the discount rate.

(2 Marks)

QUESTION 7

(a) Sonheng shop sells a Panasonic steam iron for RM 100 less 20% while Lazida shop sells the same item for RM 120 less 40%.

(i) Find the net prices of the item for the two shops.

(3 Marks)

(ii) How much additional discount percentage must be offered by the shop that sells at a higher net price in order to meet the competitor's price?

(3 Marks)

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(b) A wholesaler gives trade discounts 20%, 10% and 5% to his regular customers. He sent an invoice dated 8 September 2015 with cash terms 6/20, 4/30 and *n*/60 for the product valued RM 14,560. The products were received on 10 September 2015 and the payment was made on the 28 September 2015. Calculate

(i) the single discount equivalent to trade discounts given.

(2 Marks)

(ii) the total amount of payment made.

(8 Marks)

QUESTION 8

(a) The cost price of an antique table is RM 5,000. What is the retail price if the seller wants a 20% mark-up based on

(i) cost price?

(2 Marks)

(ii) retail price? What is the price for 3 antique tables after mark-up?

(5 Marks)

(b) A pen is priced RM 12 and markdown by 20%. Find the markdown amount and the new selling price.

(4 Marks)

END OF QUESTION PAPER

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APPENDIX

1. **Properties of logarithm**

$$\log_b(mn) = \log_b m + \log_b n$$

$$\log_b \frac{m}{n} = \log_b m - \log_b n$$

$$\log_b m^r = r \log_b m$$

$$\log_b b = 1$$

$$\log_b m = \frac{\log_a m}{\log_a b}$$

2. **Interest**

$$I = Prt$$

3. **Simple amount**

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

4. **Compound amount**

$$S = P\left(1+\frac{i}{a}\right)^{n \times a}$$

5. **Bank Discount**

$$D = Sdt$$

6. **Proceeds = maturity value – discount bank**

7. **Trade Discount = list price x trade discount rate**

8. **Cash Discount = net price x cash discount rate**

9. **Net payment**

$$NP = L(1-r)$$

Net payment = List price – trade discount – cash discount

10. **Retail/Selling price = cost price + markup/profit**

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11. Markup percent based on the cost price

$$\%M_c = \frac{M}{C} \times 100\%$$

12. Markup percent based on the retail price

$$\%M_r = \frac{M}{R} \times 100\%$$

13. Markdown = Old retail price – New retail price

14. Markdown percent

$$\%MD = \frac{MD}{OP} \times 100\%$$

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