



**FACULTY OF BUSINESS**

**FINAL EXAMINATION**

Student ID (in Figures) : 

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Student ID (in Words) : \_\_\_\_\_  
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Course Code & Name : **MAT1114 Essential Mathematics For Business**  
 Trimester & Year : SEPTEMBER – DECEMBER 2020  
 Lecturer/Examiner : DR. TEY SHEIK KYIN  
 Duration : 2 Hours

**INSTRUCTONS TO CANDIDATES**

1. This question paper consists of TWO (2) parts:
  - PART A (40 marks) : SEVEN (7) short answer questions. Answers are to be written in the Answer Sheet provided.
  - PART B (60 marks) : THREE (3) problem solving questions. Answers are to be written in the Answer Booklet provided.
2. Candidates are not allowed to bring any unauthorized materials except writing equipment into the Examination Hall. Electronic dictionaries are strictly prohibited.
3. This question paper must be submitted along with all used and/or unused rough papers and/or graph paper (if any). Candidates are NOT allowed to take any examination materials out of the examination hall.
4. Only ballpoint pens are allowed to be used in answering the questions, with the exception of multiple choice questions, where 2B pencils are to be used.

**WARNING:** The University Examination Board (UEB) of BERJAYA University College regards cheating as a most serious offence and will not hesitate to mete out the appropriate punitive actions according to the severity of the offence committed, and in accordance with the clauses stipulated in the Students’ Handbook, up to and including expulsion from BERJAYA University College.

**Total Number of pages = 4 (Including the cover page)**

**PART A : SHORT ANSWER QUESTIONS (40 MARKS)**

**INSTRUCTION(S) : SEVEN (7) short answer questions. Answer ALL questions in the Answer Booklet(s) provided.**

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1. Factor the following completely.  
(a)  $25p^2 - 70pq + 49q^2$   
(b)  $4x^2 - 2xy - 7yz + 14xz$ 

[4 marks]
2. Anita has to pay RM1100 every month for 360 months to settle a housing loan at 4% compounded monthly. Find the original value of the loan.

(4 marks)
3. A product is advertised at RM720 less 20% and 5%. Find the single discount equivalent and the net price.

(6 marks)
4. Allan wishes to invest RM8000 in a fixed deposit account for one year. He has two options:  
(A) XXX Bank which offers 3.7% interest compounded semi-annually.  
(B) YYY Bank which offers 3.75% interest compounded annually.  
Which bank should Allan choose?

(6 marks)
5. Let  
 $A = \begin{bmatrix} 2 & -1 & 3 \\ 0 & 4 & -2 \end{bmatrix}$ ,  $B = \begin{bmatrix} -3 & 1 \\ 2 & 5 \end{bmatrix}$ ,  $C = \begin{bmatrix} -1 & 0 & 2 \\ 4 & -3 & 1 \\ -2 & 3 & 5 \end{bmatrix}$ ,  $D = \begin{bmatrix} 3 & -2 \\ 0 & -1 \\ 1 & 2 \end{bmatrix}$ 
  - (a)  $ADB$ 

(2 marks)
  - (b)  $(3)BA$ 

(4 marks)
  - (c) Determinant of C

(4 marks)
6. Given demand equation:  $Q_d = 24 - 3P$  and supply equation:  $Q_s = 4P + 2$ . Find the equilibrium price and quantity.

(5 marks)
7. Dennis and Nancy are celebrating their 30<sup>th</sup> wedding anniversary by having a reception at ABC reception hall. They have budgeted RM5000 for their reception. If the reception hall charges RM50 cleanup fee plus RM45 per person, find the greatest number of people that they may invite and still stay within their budget.

(5 marks)

**[Total:40 marks]**

**END OF PART A**

**PART B : PROBLEM SOLVING QUESTIONS (60 MARKS)**

**INSTRUCTION(S) : THREE (3) problem solving questions. Answer ALL questions in the Answer Booklet(s) provided.**

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1. Given the system of linear equation

$$x + 2y + 3z = 11$$

$$y + 2z = 3$$

$$2x + 2z = 10$$

- (a) Solve the system of equation using elimination method.

(10 marks)

- (b) Solve the system of equation using augmented matrix method.

(10 marks)

**[Total: 20 marks]**

2. Maximize and minimize

$$z = 8x + 7y$$

Subject to  $4x + 3y \geq 24$

$$3x + 4y \geq 8$$

$$x, y \geq 0$$

- (a) Graph the system of inequalities and indicate whether solution region is bounded or unbounded. (Hint: without graph paper)

(14 marks)

- (b) Find the corner points.

(4 marks)

- (c) Determine the optimal solution(s) by finding the maximum value and minimum value, if exists.

(7 marks)

**[Total: 25 marks]**

3. A machine costing RM5400 has a life expectancy of six years with a salvage value of RM1200. Construct a depreciation schedule using the sum-of year digits method.

**[Total: 15 marks]**

**END OF EXAM PAPER**

## Appendix 1

1.	Future value, $S = P(1 + i)^n$	where P = principal/ present value i = interest rate n = time period/number of year R = periodic payments
2.	Future value of annuity, $S = R \left[ \frac{(1+i)^n - 1}{i} \right]$	
3.	Present value of annuity, $A = R \left[ \frac{1 - \frac{1}{(1+i)^n}}{i} \right]$	
4.	Net price, $NP = L(1 - r)$	where L = list price r = trade discount
5.	Net price for a chain discount, $NP = L(1 - r_1)(1 - r_2)(1 - r_3)$	
6.	Single discount equivalent, $r = 1 - (1 - r_1)(1 - r_2)(1 - r_3)$	
7.	Annual depreciation = $\frac{\text{cost} - \text{salvage value}}{\text{useful life}}$	where C = cost of asset r = rate of depreciation n = number of years
8.	Book value = cost – accumulated depreciation	
9.	Declining balance method book value $BV = C(1 - r)^n$	
10.	Sum of years' digits, $S = \frac{n(n+1)}{2}$	