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**UNIVERSITI TEKNOLOGI MARA  
FINAL EXAMINATION**

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<b>COURSE</b>	<b>:</b>	<b>BUSINESS MATHEMATICS</b>
<b>COURSE CODE</b>	<b>:</b>	<b>MAT402</b>
<b>EXAMINATION</b>	<b>:</b>	<b>DECEMBER 2019</b>
<b>TIME</b>	<b>:</b>	<b>3 HOURS</b>

**INSTRUCTIONS TO CANDIDATES**

1. This question paper consists of ten (10) questions.
2. Answer ALL questions in the Answer Booklet. Start each answer on a new page.
3. Do not bring any material into the examination room unless permission is given by the invigilator.
4. Please check to make sure that this examination pack consists of :
  - i) the Question Paper
  - ii) a one – page Appendix 1
  - iii) a one – page Appendix 2
  - iv) an Answer Booklet – provided by the Faculty
5. Answer ALL questions in English.

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

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*This examination paper consists of 4 printed pages*

**QUESTION 1**

Monthly expenses for raising a child increased by RM8.50 from previous month. If the expenses for the first month was RM32, compute the total expenses after 30 months?

(5 marks)

**QUESTION 2**

On 25<sup>th</sup> of February 2016, Yina deposited RM8,000 in an account that offered 4.23% simple interest rate per annum. After  $t$  days, the accumulated amount was RM8,122.20. Find the maturity date using the Banker's Rule.

(7 marks)

**QUESTION 3**

a) A promissory note dated 26 December 2018 had a face value of RM  $X$ . The interest charged was 11.5% per annum. On 5<sup>th</sup> of April 2019, the maturity value was RM2,786.25. Calculate

i) the term of the note.

(3 marks)

ii) the value of  $X$ .

(4 marks)

b) Marsela borrowed RM8,500 for 250 days from a bank that charged a bank discount of  $d$ %. If the amount of proceed was RM8,175.35, find  $d$ .

(4 marks)

**QUESTION 4**

Allex took a loan of RM15,000 from a bank at an interest rate of  $k$ % compounded every two months. The amount to be paid after 4 years 6 months is RM 21,448.86. Find

a) the value of  $k$ .

(6 marks)

b) the amount of interest charged.

(2 marks)

**QUESTION 5**

Susan borrowed RM125,000 from a finance company that charged interest of 3.75% compounded monthly. She repaid the loan by making equal monthly payment for 8 years.

- a) Calculate the monthly payment. (5 marks)
- b) Find the amount of interest charged. (4 marks)
- c) If Susan failed to pay the 56<sup>th</sup> until 60<sup>th</sup> payment, how much she should pay on the 61<sup>st</sup> payment to settle the outstanding arrears? (5 marks)

**QUESTION 6**

- a) The cash price of a used car is RM39,500. The car can be purchased through an instalment plan by making 10% down payment and monthly payment of RM675.33 for 5 years. Find the annual interest rate charged by using the Constant Ratio Formula. (6 marks)
- b) John bought a piano through an instalment plan. He paid RM500 as a down payment and 24 monthly payments of RM320 each. The interest charged was 8% based on the original balance.
- i) Calculate the interest charged for the piano. (7 marks)
- ii) Find the outstanding balance if John decided to settle the balance immediately after making the 13<sup>th</sup> payment using the Rule of 78. (3 marks)

**QUESTION 7**

A retailer bought 150 backpacks and sold it back for RM65 each. If the operating expenses were 5% based on the cost and the retailer earned 20% net profit based on the cost, calculate

- a) the cost of each backpack. (3 marks)
- b) the total gross profit. (3 marks)
- c) the total net profit obtained if the retailer managed to sell 120 backpacks and sold the remaining at 15% markdown. (5 marks)

**QUESTION 8**

On the 15<sup>th</sup> of July 2019, a retailer received an invoice worth RM40,350. The trade discounts given were 15%, 12% and the cash discount terms were 8/10, 5/20, n/30.

- a) Find the single discount equivalent rate to the given trade discounts. (3 marks)
- b) Find the total payment if the retailer paid the invoice on 31<sup>st</sup> of July 2019. (5 marks)

**QUESTION 9**

A machine has a useful life of 15 years. The book value of the machine at the end of 4<sup>th</sup> and 10<sup>th</sup> year are RM4,600 and RM1,200 respectively. Using the reducing balance method, find the salvage value of the machine.

(8 marks)

**QUESTION 10**

Mr. Erwan and his wife have 4 children. The first and second children are doing degree programme at a local university while the other two are still schooling. Their income and expenditure in RM for the year 2018 were as follows:

	<b>Mr. Erwan</b>	<b>Wife</b>
Annual Income	75,000	67,000
EPF	8,250	7,370
Life Insurance Premium	4,300	1,000
Cash Donations	1,250	500
Parent Medical Expenses	2,400	-
Sport Equipment	1,800	-
Books	700	200
Zakat	5,100	1,500

Asses their tax payable if they choose joint assessment.

(12 marks)

**END OF QUESTION PAPER**

## TAX RATE SCHEDULE FOR PERSONAL INCOME

	Taxable Income (RM)	Rate	Tax (RM)
On the first	2,500	0	0
On the next	2,500	0	0
On the first	5,000		0
On the next	15,000	1	150
On the first	20,000		150
On the next	15,000	3	450
On the first	35,000		600
On the next	15,000	8	1,200
On the first	50,000		1,800
On the next	20,000	14	2,800
On the first	70,000		4,600
On the next	30,000	21	6,300
On the first	100,000		10,900
On the next	150,000	24	36,000
On the first	250,000		46,900
On the next	150,000	24.5	36,750
On the first	400,000		83,650
On the next	200,000	25	50,000
On the first	600,000		133,650
On the next	400,000	26	104,000
On the first	1,000,000		237,650
On the next	Every RM after	28	-----

## LIST OF FORMULAE

1. $T_n = a + (n-1)d$	2. $S_n = \frac{n}{2}[2a + (n-1)d]$
3. $T_n = ar^{n-1}$	4. $S_n = \frac{a(r^n - 1)}{r - 1}$
5. $S = P(1+rt)$	6. Proceeds = $S(1-dt)$
7. $r = \frac{d}{1-dt}$	8. $d = \frac{r}{1+rt}$
9. $S = P(1+i)^n$	10. $r_e = (1+i)^m - 1$
11. $S = R \left( \frac{(1+i)^n - 1}{i} \right)$	12. $A = R \left( \frac{1 - (1+i)^{-n}}{i} \right)$
13. $SP = C + M$	14. $GP = OE + NP$
15. $NP = LP(1-d_1)(1-d_2)\dots(1-d_n)$	16. $r = \frac{2mI}{B(n+1)}$
17. $r = 1 - \sqrt[n]{\frac{S}{C}}$	18. $BV_n = C(1-r)^n$
19. $OPB = (R \times k) - I \left[ \frac{k(k+1)}{n(n+1)} \right]$	