UNIVERSITI TEKNOLOGI MARA
FINAL EXAMINATION

COURSE	:	**BUSINESS MATHEMATICS**
COURSE CODE	:	**MAT402**
EXAMINATION	:	**DECEMBER 2014**
TIME	:	**3 HOURS**

INSTRUCTIONS TO CANDIDATES

1. This question paper consists of five (5) 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 two - Appendix
   iii) an Answer Booklet – provided by the Faculty

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

QUESTION 1

a) Muthusamy invested RM18,000 into an investment scheme at r % simple interest per annum. After 260 days, the investment amounted to RM18,377. Find the value of r using the Banker's Rule.

(3 marks)

b) Ms Wong received a promissory note dated 20th March 2014 with a simple interest rate of 9% per year. The maturity date was on 15th August 2014 with maturity value of RM7,259. Find

i) the term of the note,

ii) the face value of the note.

(5 marks)

c) Fatimah is planning to invest RM5,000 for 20 years. The possible options that she might choose are as follows:

> *Scheme A: Offers a simple interest rate of 6% per annum for the first 10 years and simple interest of 7% per annum for the rest of the investment period.*
>
> *Scheme B: Offers interest at 4.5% compounded quarterly*
>
> *Scheme C: Offers a simple interest rate of 6% per annum for the first 5 years and 4% compounded annually for the rest of investment period.*

i) Calculate the maturity value of her investment under each scheme.

ii) Which scheme should she choose to invest in? Justify your answer.

(12 marks)

QUESTION 2

a) Gurkha borrowed RM ***X*** for 5 months at the discount rate of 5% from a bank. The bank discount charged was RM60. Find

i) the value of ***X***,

ii) the proceeds received by Gurkha.

(5 marks)

b) The cash price of a house is RM250,000. Steven paid a down payment of 10% and took a loan at 3.5% compounded monthly to finance the balance. The loan is to be repaid over 25 years by monthly installments.

i) Find the amount of monthly payment.

ii) If Steven failed to make the first 5 monthly payments, how much should he pay on the 6^{th} payment including the arrears?

(8 marks)

c) RM100 was invested at the end of every 3 months for 5 years. After 5 years, no more deposit was made. The interest rate is 6% compounded quarterly.

i) Find the amount in the account at the end of 7 years.

ii) If 77% of the amount in the account has been withdrawn at the end of 7 years, find the balance left in the account just after the withdrawal.

(7 marks)

QUESTION 3

a) Raju bought an electrical appliance at RM3,000 through an installment plan in which no deposit was made. The monthly installment payment was made for 24 months at a flat rate of 5.5% per annum. Find the amount of monthly payment.

(4 marks)

b) Alex bought a refrigerator for his new house. A 10% down payment was paid and the balance of RM2,000 was repaid by making 24 monthly payments. If the interest rate charged is 6% per annum on reducing balance, calculate

i) the cash price,

ii) the total interest charged by using the Constant Ratio Formula,

iii) the monthly payment,

iv) the outstanding balance immediately after the 10^{th} payment, using the Rule of 78.

(11 marks)

c) Given the sequence: $4, 3, \frac{9}{4}, \ldots, \frac{6561}{16384}$. Find

i) the number of terms in the sequence,

ii) the sum of all the terms in the sequence.

(5 marks)

QUESTION 4

a) The total trade discount of a handbag after 10%, 12% and 15% trade discounts is RM200. Find the list price and net price of the handbag.

(5 marks)

b) On 2nd July 2014, AmyTech company received an invoice for the following items:

Item	Quantity	List Price Per Unit (RM)
Computer	10	3,200
Printer	15	600

The company received trade discounts of 4% and 7%. If the cash discount term is 10/10, 5/20, n/30, find

i) the single discount rate that is equivalent to the given trade discounts,

ii) the net price of each item,

iii) the total amount of payment if it was made on the 15th July 2014,

iv) the selling price of each item if the operating expenses and the net profit are 10% and 5% respectively, based on total cost of all items.

(15 marks)

QUESTION 5

a) Fantastic laundry bought a washing machine at RM10,000. It is estimated to last for 5 years and has a salvage value of RM2,000. Find

i) the book value of the washing machine after 3 years using the straight line method,

ii) the annual rate and the amount of depreciation of the washing machine for the third year by using the declining balance method.

(8 marks)

b) Henry and Hanna are married with 4 children. The eldest is working while the other two are still in secondary school. Meanwhile, the youngest is a disable child and currently studying in a special school. Their income and expenses for the year 2013 were as follows:

Particular	Henry (RM)	Hanna (RM)
Annual Income	80,000	57,000
EPF	6,850	2,080
Zakat	1,500	950
LIP	2,000	500
Books and Journals	3,250	1,000
Parents Medical Fees	-	5,000
Approved donation	500	1900
SSPN	3,000	-
Computer	-	3,500

Calculate the tax liability for the assessment year using separate assesment.

(12 marks)

END OF QUESTION PAPER

TAX RATE SCHEDULE FOR PERSONAL INCOME

	Taxable Income (RM)	Rate	Tax (RM)
On the first On the next	2,500 2,500	0 0	0 0
On the first On the next	5,000 5,000	2	0 100
On the first On the next	10,000 10,000	2	100 200
On the first On the next	20,000 15,000	6	300 900
On the first On the next	35,000 15,000	11	1,200 1,650
On the first On the next	50,000 20,000	19	2,850 3,800
On the first On the next	70,000 30,000	24	6,650 7,200
On the first On the next	100,000 Every RM after	26	13,850 ----------

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. $NP = LP(1 - d_1)(1 - d_2).....(1 - d_n)$	16. $r = \frac{2mI}{B(n+1)}$
17. $r = 1 - \sqrt[n]{\frac{S}{C}}$	18. $BV_n = C(1 - r)^n$
19. $OPB = (R \times k) - I\left(\frac{k(k+1)}{n(n+1)}\right)$	