UNIVERSITI TEKNOLOGI MARA
FINAL EXAMINATION

COURSE	:	**BUSINESS MATHEMATICS**
COURSE CODE	:	**MAT402**
EXAMINATION	:	**DECEMBER 2013**
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) an Answer Booklet – provided by the Faculty
   iii) a one-page Appendix 1 (Tax Rate Schedule for Personal Income)
   iv) a one-page Appendix 2 (List of Formulae)

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

This examination paper consists of 5 printed pages

QUESTION 1

a) Given a sequence 15, 30, 60, ..., 983040.

i) Determine whether the sequence is arithmetic or geometric. Justify your answer.

(2 marks)

ii) Find the number of terms in the sequence.

(4 marks)

iii) Find the sum of the terms from T_{15} until the last term.

(4 marks)

b) A father decided to invest RM5000 when his daughter is born. His intention is to make sure that his daughter will have enough fund when she furthers her study at the age of 18. The following information describes the offers given by three banks.

Bank Mawaddah: Offers a simple interest rate of 6% per annum.

Bank Amanah: Offers a simple interest rate of 7% per annum for the first 5 years and simple interest rate of 5% per annum for the rest of investment period.

Bank Ukhuwwah: Offers a 4.5% compounded monthly for the first 10 years, and 4% compounded semi-annually for the rest of the investment period.

i) Calculate the possible interest earned for his investment at each of these three banks.

(9 marks)

ii) Which bank should he choose to invest in? Justify your answer.

(1 mark)

QUESTION 2

a) When Victor was 30 years old, he started to deposit RM150 at the end of every month in an account that pays 2% compounded monthly. However, five years later, he decided to withdraw RM1000. Then, he left the account untouched until he reached 50 years old. Calculate the total amount of money in the account when he was 50 and the total interest earned for this investment.

(8 marks)

b) Zamri intends to make a loan to finance his business. He is comparing two options namely Scheme A and Scheme B. Scheme A is a simple promissory note which offers RM7500 for 90 days with a simple interest rate of 12% per annum. While Scheme B offers RM7500 with a bank discount loan of 12% for 90 days.

i) Compare the value of interest of Scheme A with the bank discount amount of Scheme B.

(4 marks)

ii) Find the amount received by the borrower in each case.

(3 marks)

iii) Find the maturity value for each scheme.

(3 marks)

iv) Which scheme is better for Zamri as a borrower? Give your reason(s).

(2 marks)

QUESTION 3

a) Amsyari borrowed RM80000 from a bank for 9 years at the interest of 11.5% compounded monthly.

i) Find the monthly repayment.

(3 marks)

ii) Calculate the total interest paid for the loan.

(2 marks)

iii) Determine the 3rd repayment amount to settle all arrears if he has not paid the first two repayments.

(3 marks)

iv) Immediately after the 90th payment, Amsyari decided to settle the loan. Calculate the amount of settlement.

(3 marks)

b) Fathul wishes to purchase a set of kitchen cabinets that costs RM12,080 and he has two options to consider:

	Option 1	**Option 2**
Down Payment	RM455	RM455
Interest Rate	10% flat rate	10% by Constant Ratio Formula
Mode of Payment	Weekly	Monthly
Period of Payment	76 weeks. Assuming 1 year = 52 weeks	19 months

For each option, calculate the interest charged and the periodic payment.

(9 marks)

QUESTION 4

a) Amri bought 200 balls at RM22.50 per unit on 26th May 2013. He received an invoice with trade discounts of 10%, 6%, and 5%, and a cash discount term of 6/5, 3/10, n/30 respectively. The freight charge is RM250.

i) Explain the cash discount term of 6/5, 3/10, n/30.

(3 marks)

ii) Calculate the single trade discount rate which is equivalent to the trade discount given.

(2 marks)

iii) Find the total payment if the invoice is cleared on 1st June 2013.

(5 marks)

b) Aryan purchased an antique piano for X ringgit and sold it at RM10855. If the operating expenses was 15% of the cost and the net profit was 25% on retail price, determine

i) the value of X.

(3 marks)

ii) the total gross profit made by Aryan.

(1.5 marks)

iii) the maximum trade discount Aryan could offer without incurring any loss.

(3.5 marks)

iv) the net profit or loss if Aryan sold the piano at RM8000.

(2 marks)

QUESTION 5

a) Five years ago Salleh bought a tractor, which currently has a value of RM8500. This tractor has a life expectancy of another 15 years. At the end of its life, the tractor will have a value of RM5000. By using the straight line method, calculate the cost of the tractor. Then, calculate its annual depreciation.

(3 marks)

b) The depreciation for the third year of a machine is RM5000. If the annual rate of depreciation is 2%, find the cost for the machine using declining balance method.

(3 marks)

c) Syakir and his wife have four children aged between 12 and 20 years old. The eldest is studying degree level at a foreign university while the rest of their children go to the local school. The youngest child is a handicap student. Their incomes and expenses (RM) for the year of 2013 are as follows.

DETAIL	RM	
	Syakir	Wife
EPF	11% of annual income	
Life Insurance premium	3,000	3,000
Health Insurance	1,200	-
Donations	500	200
Medical Expenses for parents	-	8,000
Books	800	1,500
SSPN	1,200	-
Zakat	2.5% on annual income	2.5% on annual income
Monthly Salary	6,500	3,750

Assess their tax payable for 2013 if they choose separate assessment.

(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 1	0 25
On the first On the next	5,000 5,000	3	25 150
On the first On the next	10,000 10,000	3	175 300
On the first On the next	20,000 15,000	7	475 1,050
On the first On the next	35,000 15,000	12	1,525 1,800
On the first On the next	50,000 20,000	19	3,325 3,800
On the first On the next	70,000 30,000	24	7,125 7,200
On the first On the next	100,000 Every RM after	26	14,325 ---

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. $S_n = a\left(\frac{r^n-1}{r-1}\right), r>1$
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. $r = (1+i)^m - 1$
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. $M = GP = OE + NP$
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. $OPB = (R\times k) - I\left(\frac{k(k+1)}{n(n+1)}\right)$	