UNIVERSITI KUALA LUMPUR
Malaysian Institute of Marine Engineering Technology

FINAL EXAMINATION
JANUARY 2016 SESSION

SUBJECT CODE	:	LGB 11103
SUBJECT TITLE	:	BUSINESS MATHEMATICS 1
LEVEL	:	BACHELOR
TIME / DURATION	:	09.00 AM – 12.00 PM / 3 HOURS
DATE	:	26 MAY 2016

INSTRUCTIONS TO CANDIDATES

1. Please read the instructions given in the question paper CAREFULLY.
2. This question paper is printed on both sides of the paper.
3. Please write your answers on the answer booklet provided.
4. Answer should be written in blue or black ink except for sketching, graphic and illustration.
5. Answer FOUR (4) questions only
6. Answer all questions in English.

THERE ARE 6 PAGES OF QUESTIONS, INCLUDING THIS PAGE.

INSTRUCTION: Answer FOUR questions.

Please use the answer booklet provided.

Question 1

(a)   Given $h(t) = 2t^2 - 1$ and $m(t) = t + 5$. Calculate

     i. $h \circ m(t)$ and   [3 marks]

     ii.   the value of $m \circ m\left(-\dfrac{1}{2}\right)$.   [3 marks]

(b)   Given $q(t) = \dfrac{t+1}{t-2}$ where $t \neq 2$, calculate $q^{-1}(t)$.   [5 marks]

(c)   Solve the value of a for $\dfrac{2a-b}{7} \geq \dfrac{a+5b}{2} + \dfrac{b}{3}$ if $b = -1$.   [6 marks]

(d)   In a sauna hot tub is increase the temperature by 5% each hour. If the present temperature of the hot tub is 85° F. Determine the temperature of the hot tub after three hours to the nearest tenth of a degree.

                                                                        [3 marks]

(e)   Calculate the number of terms for the geometric sequence $1, -3, 9, -27, \ldots, 729$.

                                                                          [5 marks]

Question 2

(a)   Give the definition of the following terms:

    i.   Banker's Rule.   [1 marks]

    ii.   Ordinary Interest.   [1 marks]

(b)   Zarif obtains RM 4000 loan from a bank that charges an interest of 6.75%. The loan was granted on January 11, 2015 and matures on September 25, 2015. Calculate the maturity value of the loan.

[6 marks]

(c)   RM 25 000 was invested on June 4, 2012. If the money is worth 6% compounded daily, what is the value of this investment

    i.   after 101 days?   [3 marks]

    ii.   on January 3, 2013?   [6 marks]

(d)   A total of RM8000 is invested into two simple interest accounts. The annual simple interest rate on one account is 7%; on the second account, the annual simple interest rate is 6%. How much should be invested in each account so that both accounts earn the same amount of annual interest?

[8 marks]

Question 3

(a)   Qistina purchased a house that cost RM200 000. She paid a 9% down payment and applied for a bank loan to settle the balance of the purchase price. The loan which is for 20 years is to be paid by monthly installments at an interest of 10% compounded monthly.

      i.   Calculate the monthly instalment.   [5 marks]

      ii.   Qistina defaulted in paying 4 successive instalments. How much should she pay on the next instalment for her remaining instalments to be on schedule?

              [5 marks]

      iii.   What is the outstanding balance after paying regular instalments for 15 years?   [6 marks]

(b)   Calculate the nominal interest rate j % compounded semi-annually which is equivalent to

      i.   an effective interest rate of 8.5% and   [4 marks]

      ii.   a nominal interest rate of 9.15% compounded quarterly.   [5 marks]

Question 4

(a) The list price of the Samsung A8 is RM2000. A trade discount of 15% is given.

    i. Determine the net price? [4 marks]

    ii. If the retailer give another 5% discount to loyal customer, calculate the net price for loyal customer.

[3 marks]

(b) The MAC notebook with a list price of RM8880 is given trade discount of 9%, 11% and 10%. Calculate the net price of the MAC notebook.

[3 marks]

(c) An invoice dated 2 August 2015, has term $5/10, 3/20$, net 40.

    i. What is the last day to make payment in order to obtain the cash discount?

[6 marks]

    ii. What is the final day to pay the invoice without incurring any late charges?

[3 marks]

(d) An invoice for the amount of RM2346 is given a 10%. The cash discount is $5/15, n/30$. The date of the invoice is September 22, 2015. How much be paid if the invoice is paid on October 6?

[6 marks]

Question 5

(a) City Chain purchased a number of watches at RM 250 each. The shop wants a 45% markup on the selling price. Soon after, the shop launched a sale and marked down the price of the watches by 18%. For each watch, calculate

    i.   the selling price before markdown. [3 marks]

    ii.   The selling price during the sale. [3 marks]

(b) One Radius Sdn Bhd purchased a number of notebooks at RM980 each. The trade discount given was 7% while the cost of delivery was RM25 per notebook. The company sells the notebooks at 45% markup on the selling price. The installation charged for each notebook was RM55. Determine

    i.   the selling price per notebook. [8 marks]

    ii.   the net profit per notebook. [5 marks]

    iii.   Due to a slow sale, the company marked down the price by 10% and spent an additional RM18 for a free gift to go with each notebook. What was the net profit per notebook?

[6 marks]

END OF QUESTIONS

FORMULAE OF BUSINESS MATHEMATICS 1

SEQUENCES

ARITHMETIC SEQUENCE	GEOMETRIC SEQUENCE
$T_n = a + (n-1)d$	$T_n = ar^{n-1}$
$S_n = \dfrac{n}{2}[2a + (n-1)d]$	$S_n = \dfrac{a(1-r^n)}{1-r} \quad ,r < 1$
	$S_n = \dfrac{a(r^n - 1)}{r-1} \quad ,r > 1$

INTEREST

SIMPLE INTEREST	COMPOUND INTEREST
$I = Prt$	$S = P(1+r)^n$
$S = P + I$	$r = \left(1 + \dfrac{j}{m}\right)^m - 1$

ANNUITY

FUTURE VALUE	PRESENT VALUE
$S = R\dfrac{(1+r)^n - 1}{r}$	$A = R\dfrac{1 - (1+r)^{-n}}{r}$

TRADE AND CASH DISCOUNT

$Net\ Price = List\ Price - Trade\ Discount$

MARKUP AND MARKDOWN

MARKUP	MARKDOWN
$C + MU = SP$	$OP - RP = MD$
$SP = C + OE + NP$	