UNIVERSITI KUALA LUMPUR
Malaysian Institute of Marine Engineering Technology

FINAL EXAMINATION
JANUARY 2016 SESSION

SUBJECT CODE	:	LGB 11203
SUBJECT TITLE	:	BUSINESS MATHEMATICS 2
LEVEL	:	BACHELOR
TIME / DURATION	:	09.00 AM – 12.00 PM / 3 HOURS
DATE	:	18 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 9 PAGES OF QUESTIONS, INCLUDING THIS PAGE.

INSTRUCTION: Answer FOUR questions.

Please use the answer booklet provided.

Question 1

(a)   Solve $\dfrac{-5}{j^{24}}$.

(3 marks)

(b)   Given $Z_1 = 0.25 - 0.4i$ and $Z_2 = -0.33 + 0.45i$. Determine :

    i. $Z_1 Z_2$, and

(3 marks)

    ii. $\dfrac{Z_2}{Z_1}$

(5 marks)

(c)   Differentiate $f(x) = x^3 \left(2x^2 + 2\right)^2$.

(4 marks)

(d)   The curve $y = ax^2 + bx + c$ passes through (2,3) and the line $y = x$ is a tangent to the curve at the point of origin. Determine the value of a, b and c.

(6 marks)

(e)   Solve $\displaystyle\int_1^2 4x\left(x^2 + 3\right)dx$

(4 marks)

Question 2

(a)   Identify four key features of a credit card.

(2 marks)

(b)   Fahry traded in his old car for RM40,000 to purchase a brand new car that costs RM98,000. To settle the balance, he obtained financing at a rate of 7.5%, to be repaid by monthly instalments over 6 years. Calculate the monthly payment.

(7 marks)

(c)   A 10% down payment for a house is RM 10,000. The balance has to be repaid by making monthly instalments for ten years. If the interest rate charged is 6% per annum on reducing balance, calculate

i.   the cash price of the house

(3 marks)

ii.   the total interest charged

(7 marks)

iii. the instalment price

(3 marks)

iv.   the monthly payment

(3 marks)

Question 3

(a)   Briefly explained the difference of depreciation calculation in the following
       methods
       i.   The straight line method
       ii.   The declining balance method
       iii. The sum-of-year digits method

(6 marks)

(b)   Raisha wants to sell her car, which was purchased for RM110,000 after
       using it for five years. The residual value after ten years was estimated to be
       RM30,000. Two second – hand car dealers offered to sell her car based on
       the book value. Agency A used the declining balance method while Agency
       B used the sum – of – year digits method to calculate the depreciation of the
       car.

       i.   As agency A, calculate the book value of the car after five years.
(5 marks)

       ii.   As agency B, calculate the book value of the car after five years.
(5 marks)

       iii. Which agency should Raisha choose to sell his car? State your reason
(2 marks)

(c)   Sugar & Spice Company bought a machine for RM58,000. The machine is
       expected to last five years and its salvage value at the end of five years is
       RM8,000. Using the straight line method, calculate:
       i.   The annual depreciation.

(2 marks)

       ii.   The annual rate of depreciation.

(2 marks)

       iii. The book value of the machine at the end of the third year.

(3 marks)

Question 4

(a)   Erika purchased a refrigerator for RM5599 through an instalment plan. She has to pay RM800 downpayment and 18 monthly payments of RM415 each. Determine

i.   instalment price,

(3 marks)

ii.   total interest charged

(2 marks)

iii.   flat rate (simple interest rate) charged

(3 marks)

iv.   approximate APR by using the Constant Ratio formula

(4 marks)

(b)   Boasted Naval Shipyard maintenance manager has two choices to buy a machine with a cash price of RM60000. He can use the hire purchase scheme offered by the headquarters of company, which consists of 24 monthly instalment of RM2900 each or he can apply for an industrial loan pay for the machine in cash. The interest on the industrial loan will be 9% and it will need to be repaid by monthly payment for three years. The manager wants to choose the option with the lower APR.

i.   Which option should he choose?

(10 marks)

ii.   Calculate the amount he can save if he chooses (i).

(3 marks)

Question 5

Particulars regarding the income of Zhafran and his wife as shown in Table 1.

Table 1

	ZHAFRAN	WIFE
Salary	RM5500 / month	RM3200 / month
EPF	11% of salary	11% of salary
LIP	RM200 / month	RM150 / month
Children covered	i. 2 sons – studying at UITM Shah Alam. ii. 4 years-old son.	Two daughters – studying at Sek. Men. Keb. Seri Samudera.
Cash donations	RM500	RM300
Medical expenses for parents	RM2000	RM1500
Zakat	4% of annual salary	4% of annual salary
Sport Equipment	RM250	RM100
Further Study (Master)	RM2300 / year	-
Laptop	RM2300	RM1700
Books	RM850	RM250

Assess Zhafran tax payable if he elects

(a) joint assessment, and

(9 marks)

(b) separate assessments.

(16 marks)

Question 6

(a)   The following information is available for a small corporation as of December 31, 2015.

Table 2

Mortgage outstanding	RM80600
Merchandise inventory	RM24180
Taxes due	RM33150
Cash on hand	RM80600
Equipment	RM239200
Account Payable	RM15795
Building	RM119925
Account receivable	RM32013
Earning retained in business	RM99450

i.   Calculate the amount of total asset and total liabilities.

(2 marks)

ii.   Determine the amount of total fixed asset and total long-term liabilities.

(2 marks)

iii.   Determine the amount of stakeholder's equity.

(2 marks)

iv.   Assume that total assets and total liabilities for the firm at the end of 2014 were RM513492 and RM157324, respectively. Calculate the changes and the percent change in these quantities between 2014 and 2015.

(4 marks)

(b) Maria was considering investing in a business. She used the following statement (Table 3 and Table 4) in analysing the Hana Clock Shop.

Table 3

Hana Clock Shop

Comparative Balance Sheet

As of December 31, 2013 and 2014

	2013	2014
ASSETS **Current assets**		
i. Cash	RM110,000	RM104,600
ii. Accounts receivable	RM135,000	RM115,900
iii. Merchandise inventory	RM185,000	RM145,000
Total current assets	**RM430,000**	**RM365,500**
Fixed Assets		
i. Building improvements	RM45,000	RM48,500
ii. Equipment	RM145,000	RM132,000
Total fixed assets	**RM190,000**	**RM180,500**
TOTAL ASSETS	**RM620,000**	**RM546,000**
LIABILITIES **Current liabilities**		
i. Salaries payable	RM33,000	RM28,200
ii. Accounts payable	RM120,000	RM112,900
Total current liabilities	**RM153,000**	**RM141,100**
Long-term liabilities		
iii. Note payable	RM100,000	RM120,000
TOTAL LIABILITIES	**RM253,000**	**RM261,100**
Owner's equity: Hana Clock Shop, capital	RM367,000	RM284,900
TOTAL LIABILITIES AND OWNER'S EQUITY	**RM620,000**	**Rm546,000**

Table 4

Hana Clock Shop

Comparative Income Statement

For the year ended December 31, 2013 and 2014

	2013	2014
NET SALES Cost of goods sold:	RM780,000	RM835,000
Merchandise Inventory, January 1	RM145,000	RM138,000
Purchases	RM585,000	RM620,000
Merchandise available for sales	RM730,000	RM758,000
Merchandise Inventory, December 31	RM185,000	RM145,000
Cost of goods sold	**RM545,000**	**RM613,000**
Gross profit on sales	RM235,000	RM222,000
Expenses:		
Selling	RM82,000	RM78,600
Other	RM29,200	RM30,200
Total expenses	RM111,200	RM108,800
NET INCOME	RM123,800	RM113,200

Calculate the following information in year 2013 and 2014 for Maria's consideration.

    i.   Working capital ratio

                           (3 marks)

    ii.   Acid-test ratio

                           (3 marks)

    iii.   Ratio of accounts receivable to net sales

                           (3 marks)

    iv.   Inventory turnover

                           (3 marks)

    v.   Ratio of net income to net sales

                           (3 marks)

END OF QUESTIONS

FORMULAE OF BUSINESS MATHEMATICS 2

DIFFERENTIATION

STANDARD FORM	GENERAL FORM
$\dfrac{d}{dx}\ln x = \dfrac{1}{x}$	$\dfrac{d}{dx}\ln f(x) = \dfrac{f'(x)}{f(x)}$
$\dfrac{d}{dx}e^x = e^x$	$\dfrac{d}{dx}e^{f(x)} = f'(x)\,e^{f(x)}$
$\dfrac{d}{dx}(\sin x) = \cos x$ $\dfrac{d}{dx}(\cos x) = -\sin x$ $\dfrac{d}{dx}(\tan x) = \sec^2 x$	$\dfrac{d}{dx}(\cot x) = -\csc^2 x$ $\dfrac{d}{dx}(\sec x) = \sec x \tan x$ $\dfrac{d}{dx}(\csc x) = -\csc x \cot x$

INTEGRATION

STANDARD FORM	GENERAL FORM Where : $f(x) = ax + b$
$\displaystyle\int e^x dx = e^x + c$	$\displaystyle\int e^{f(x)}\,dx = \dfrac{e^{f(x)}}{f'(x)} + c$
$\displaystyle\int \dfrac{1}{x}dx = \ln|x| + c$	$\displaystyle\int \dfrac{1}{f(x)}dx = \dfrac{\ln|f(x)|}{f'(x)} + c$
$\displaystyle\int \sin x\,dx = -\cos x + C$ $\displaystyle\int \cos x\,dx = \sin x + C$ $\displaystyle\int \sec^2 x\,dx = \tan x + C$	$\displaystyle\int \sec x \tan x\,dx = \sec x + C$ $\displaystyle\int \csc^2 x\,dx = -\cot x + C$ $\displaystyle\int \csc x \cot x\,dx = -\csc x + C$

CREDIT CARD AND LOANS

$$I = PRT$$

INSTALLMENT PURCHASE

$$APR = \dfrac{2mI}{B(n+1)}$$

$$Amount\ of\ refund = \dfrac{1+2+\ldots+N}{1+2+\ldots+n} \times I$$

$$1+2+\ldots+n = \dfrac{n(n+1)}{2}$$

DEPRECIATION

$$Depreciation = \frac{100\%}{Estimated\ life\ in\ years} \times 2$$

$$= Cost \times depreciation\ rate$$

$$= Cost - Salvage\ Value$$

$$= \frac{Cost - Salvage\ Value}{Estimated\ Life}$$

TAXATION

$$Marked\ Price = \frac{Total\ Price}{1 + Sales\ tax\ rate}$$

$$Amount\ of\ refund = \frac{1 + 2 + ... + N}{1 + 2 + ... + n} \times I$$

INSURANCE

$$Annual\ Premium = \frac{Amount\ of\ coverage}{\$100} \times rate$$

FINANCIAL STATEMENTS

$$Net\ Sales = total\ sales - sales\ returns\ and\ allowances$$

$$Cost\ of\ goods\ sold = beginning\ inventory + purchases - ending\ inventory$$

$$Gross\ profit = net\ sales - cost\ of\ goods\ sold$$

$$Net\ income = gross\ profit - operating\ expenses$$

RATIO MANAGEMENT

$$Current\ Ratio = \frac{Current\ Assets}{Current\ Liabilities}$$

$$Acid - Test\ Ratio = \frac{Quick\ Current\ Assets}{Current\ Liabilities}$$

$$Operating\ Ratio = \frac{Cost\ of\ Goods\ Sold + Operating\ Expenses}{Net\ Sales}$$

$$Gross\ profit\ margin\ ratio = \frac{Net\ Sales - Cost\ og\ goods\ sold}{Net\ Sales}$$

$$Inventory\ Turnover = \frac{Cost\ of\ Goods\ Sold}{Average\ Inventory}$$

$$Average\ Inventory = \frac{Beginning\ Inventory + Ending\ Inventory}{2}$$

Pelepasan Cukai Individu Pemastautin

Tahun 2010, 2011, 2012, 2013, 2014 & 2015

Bil.	Jenis Potongan Individu	Amaun (RM)
1	Individu dan saudara tanggungan Pelepasan Khas RM2,000 diberi kepada pembayar cukai yang berpendapatan sehingga RM8,000 sebulan (Pendapatan Aggregat sehingga RM96,000 setahun.) **Pelepasan ini hanya diberi untuk Tahun Taksiran 2015 sahaja.**	9,000
2	Perbelanjaan Perubatan Ibu Bapa	5,000 (Terhad)
3	Peralatan Sokongan Asas (untuk individu kurang upaya atau untuk isteri, anak atau ibubapa kurang upaya)	i) 5,000 (Terhad) - tahun taksiran 2014 dan sebelum ii) 6,000 (Terhad) - mulai tahun taksiran 2015
4	Individu Kurang Upaya	6,000
5	Yuran Pendidikan (Sendiri)	5,000 (Terhad)
6	Perbelanjaan perubatan penyakit yang sukar diubati (individu atau suami/isteri atau anak-anak)	i) 5,000 (Terhad) - tahun taksiran 2014 dan sebelum ii) 6,000 (Terhad) - mulai tahun taksiran 2015
7	Pemeriksaan perubatan penuh	500 (Terhad)

8	Pembelian buku, majalah, jurnal dan penerbitan	1,000 (Terhad)
9	Pembelian komputer peribadi untuk individu (sekali setiap 3 tahun)	3,000 (Terhad)
10	Tabungan bersih dalam skim SSPN	3,000 (Terhad)
11	Tabungan bersih dalam skim SSPN (berkuatkuasa Tahun Taksiran 2012 - 2017)	6,000 (Terhad)
12	Pembelian peralatan sukan untuk aktiviti sukan	300 (Terhad)
13	Yuran langganan Jalur Lebar (Berkuatkuasa Tahun Taksiran 2010 - 2012)	500 (Terhad)
14	Faedah pembelian rumah. Potongan cukai terhad kepada RM10,000 setiap tahun asas bagi 3 tahun taksiran berturut-turut bermula dari tarikh faedah mula dibayar. Syarat kelayakan: (i) pemastautin warganegara Malaysia; (ii) pembelian rumah kediaman terhad kepada satu unit sahaja; (iii) perjanjian jual beli ditandatangani dalam tempoh 10 Mac 2009 sehingga 31 Disember 2010; dan (iv) rumah kediaman tersebut tidak disewakan. Di mana: (a) 2 atau lebih individu layak menuntut potongan bagi sebuah rumah kediaman; dan (b) jumlah faedah yang dibelanjakan oleh kesemua individu berkenaan melebihi amaun yang dibenarkan dalam tahun itu. Setiap individu dibenarkan suatu potongan bagi setiap tahun mengikut formula berikut: $A \times \dfrac{B}{C}$ Di mana; A = jumlah faedah dibenarkan dalam tahun berkenaan; B = jumlah faedah dibelanjakan oleh individu berkenaan dalam tahun berkenaan; C = jumlah faedah dibelanjakan oleh kesemua individu	10,000 (Terhad)
15	Suami/Isteri/Bayaran alimoni kepada bekas isteri	3,000 (Terhad)

16	Suami/Isteri kurang upaya	3,500
17	Anak di bawah umur 18 tahun	1,000
18	Anak yang belum berkahwin dan berumur 18 tahun dan ke atas dan menerima pendidikan sepenuh masa (peringkat A-Level, sijil, matrikulasi, persediaan atau pra-ijazah)	1,000
19	Anak yang belum berkahwin dan berumur 18 tahun dan ke atas tertakluk kepada syarat-syarat berikut: (i) mengikuti kursus di peringkat diploma dan ke atas di institusi pengajian tinggi dalam Malaysia (tidak termasuk kursus matrikulasi/pra-ijazah). (ii) mengikuti kursus di peringkat ijazah dan ke atas di institusi pengajian tinggi luar Malaysia. (iii) kursus dan institusi pengajian tinggi diiktiraf oleh pihak berkuasa Kerajaan yang berkaitan.	i. 4,000 (tahun taksiran 2012 dan sebelum) ii. 6,000 (berkuatkuasa mulai tahun taksiran 2013 dan seterusnya)
20	Anak Kurang upaya Pelepasan tambahan sebanyak RM4,000 bagi anak kurang upaya berumur 18 tahun dan ke atas, belum berkahwin dan mengikuti diploma ke atas di dalam Malaysia @ peringkat ijazah ke atas di luar Malaysia dalam kursus dan di IPT yang diiktiraf oleh pihak berkuasa Kerajaan yang berkaitan. (Berkuatkuasa mulai Tahun Taksiran 2013 Pelepasan tambahan adalah sebanyak RM6,000)	i) 5,000 - tahun taksiran 2014 dan sebelum ii) 6,000 - mulai tahun taksiran 2015
21	Insuran nyawa dan KWSP	6,000 (Terhad)
22	Skim anuiti baru atau tambahan jumlah anuiti sedia ada dan bayaran di buat mulai 01/01/2010 (apa-apa lebihan daripada premium anuiti baru atau tambahan melebihi RM1,000 boleh dituntut dan diambil kira bersama-sama jumlah premium insurans nyawa) - tidak terpakai mulai Tahun Taksiran 2012 - 2021	1,000 (Terhad)

Rebat Cukai Pendapatan Bagi Individu Yang Mempunyai Pendapatan Bercukai Kurang Daripada RM35,000.

No	Rebat Cukai	Tahun Taksiran 2001 - 2008 (RM)	Tahun Taksiran 2009 & Seterusnya (RM)
a	Taksiran Berasingan	-	-
	Isteri	350	400
	Suami	350	400
b	Taksiran Bersama	-	-
	Isteri	350	400
	Suami	350	400
	Jumlah	700	800
b	Taksiran Di mana Salah Seorang Suami Atau Isteri Tiada Jumlah Pendapatan	-	-
	Isteri	350	400
	Suami	350	400
	Jumlah	700	800

Lain-Lain Rebat Cukai

No	Rebat Cukai	(RM)
a	Zakat/Fitrah	Amaun maksimum tertakluk kepada cukai yang dikenakan

b   Levi Pekerja Asing (Tidak terpakai mulai tahun taksiran 2011)   Amaun maksimum tertakluk kepada cukai yang dikenakan

Tahun Taksiran 2016

Banjaran Pendapatan Bercukai	Pengiraan (RM)	Kadar %	Cukai(RM)
0 - 2500	2,500 pertama	0	0
2,501 - 5,000	2,500 berikutnya	0	0
5,001 - 10,000	5,000 pertama		0
	5,000 berikutnya	1	50
10,001 - 20,000	10,000 pertama		50
	10,000 berikutnya	1	100
20,001 - 35,000	20,000 pertama		150
	15,000 berikutnya	5	750
35,001 - 50,000	35,000 pertama		900
	15,000 berikunya	10	1,500
50,001 - 70,000	50,000 pertama		2,400
	20,000 berikutnya	16	3,200
70,001 - 100,000	70,000 pertama		5,600
	30,000 berikutnya	21	6,300
100,001 - 150,000	100,000 pertama		11,900
	50,000 berikutnya	24	12,000
150,001 - 250,000	150,000 pertama		23,900
	100,000 berikutnya	24	24,000
250,001 - 400,000	250,000 pertama		47,900
	150,000 berikutnya	24.5	36,750
400,001 - 600,000	400,000 pertama		84,650
	200,000 berikutnya	25	50,000
600,001 - 1,000,000	600,000 pertama		134,650
	400,000 berikutnya	26	104,000