UNIVERSITI KUALA LUMPUR
MALAYSIAN INSTITUTE OF MARINE ENGINEERING TECHNOLOGY

FINAL EXAMINATION
SEPTEMBER 2016 SEMESTER

COURSE CODE	:	LGB11203
COURSE NAME	:	BUSINESS MATHEMATICS 2
PROGRAMME NAME (FOR MPU: PROGRAMME LEVEL)	:	BACHELOR OF MARITIME OPERATION
DATE	:	17 JANUARY 2017
TIME	:	02.00 PM – 05.00 PM
DURATION	:	3 HOURS

INSTRUCTIONS TO CANDIDATES

1. Please CAREFULLY read the instructions given in the question paper.

2. This question paper has information printed on both sides of the paper.

3. This question paper consists of TWO (2) sections; Section A and Section B.

4. Answer ALL questions in Section A. For Section B, answer THREE (3) questions.

5. Please write your answers on the answer booklet provided.

6. Answer all questions in English language ONLY.

THERE ARE 8 PAGES OF QUESTIONS, INCLUDING THIS PAGE.

PART A (Total: 40 marks)

INSTRUCTION: Answer ALL questions.

Please use the answer booklet provided.

Question 1

(a)   Solve $-\left(\dfrac{i^4}{2}\right)^{-1}$.

(3 marks)

(b)   Differentiate $f(x) = \left(5x^2 - 1\right)^{-2}$.

(3 marks)

Question 2

(a)   Determine the one-month interest be for a RM5000 credit card balance with a 12% APR?

(3 marks)

(b)   With customer's first purchase on a credit card, they have entered into a legal agreement with the credit card company. Customers then must understand and abide by the terms and conditions of the agreement. Give at least three (3) customer responsible in managing their credit cards.

(3 marks)

Question 3

(a)   Rebates are amount that can be deducted from the tax amount. List TWO (2) types of rebates.

(2 marks)

(b)   James and his wife file separate assessment. His chargeable income is RM45000 and his wife's is RM28000. Assess their tax payable.

(5 marks)

Question 4

(a)   Asset such as machinery and vehicle depreciate in value and companies usually dispose their assets for better decisions on dispose value. An asset costing RM 2000 depreciates at rate of 20%. How long does it takes for the asset to have a salvage value of RM500?

(4 marks)

(b)   As opposed to simple interest rate, interest rate charged on reducing balance is an annual rate which is applied only to the balance due at the time of each payment. A 10% down payment for a house is RM10000. 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 the monthly payment.

(3 marks)

Question 5

(a)   Briefly explain TWO (2) differences between horizontal and vertical analysis in balance sheet.

(4 marks)

(b)   Complete this partial comparative balance sheet as shown in Table 1 by vertical analysis. Round percent to the nearest hundredth.

Table 1: Balance sheet of Sinvisc & Co Sdn.Bhd

	2015		2014	
	Amount	Percent	Amount	Percent
Assets **Current assets**				
a) Cash	RM42000		RM40000	
b) Accounts receivable	RM18000		RM17000	
c) Merchandise inventory	RM15000		RM12000	
d) Prepaid expenses	RM17000		RM14000	
⋮	⋮		⋮	
Total current assets	**RM160000**		**RM150000**	

(3 marks)

Question 6

(a)   The balance sheet of Maxsteel Sdn Bhd Company is shown in Table 2. Calculate the acid – test ratio.

Table 2: Balance sheet of Maxsteel Sdn Bhd

Cash	$60,000	Accounts Payable	$30,000
Marketable Securities	$10,000	Accrued Expenses	$20,000
Accounts Receivable	$40,000	Notes Payable	$5,000
Inventory	$50,000	Current Portion of Long-Term Debt	$10,000
Total Current Assets	$160,000	Total Current Liabilities	$65,000

(3 marks)

(b)   The facts as shown in Table 3 are for Hardship Company, a local ship material goods store (rounded to the nearest hundredth). Calculate the inventory turnover at retail and at cost.

Table 3: Financial facts for Hardship Company

- Net sales – RM 132000
- Beginning inventory at retail – RM111000
- Ending inventory at retail – RM18900
- Cost of goods sold – RM122000
- Beginning inventory at cost – RM17500
- Ending inventory at cost – RM15600

(4 marks)

PART B (Total: 60 marks)

INSTRUCTION: Answer THREE questions.
Please use the answer booklet provided.

Question 7

(a)   Given that $Z_1 = 1 - i$, $Z_2 = -2 + 8i$ and $Z_3 = -6 - 5i$. Simplify $\dfrac{(Z_2)^2}{Z_3}$.

(4 marks)

(b)   Determine $Q'(r)$ for $Q(r) = \left(r^2 - \dfrac{1}{r} \right)^2 \left(r^2 - 1 \right)$

(8 marks)

(c)   Marginal revenue, $R'(x)$ of a certain product is given as $R'(x) = 40 - 0.02x$ where x is the level of output, calculate

   i.   the total revenue function

(4 marks)

   ii.   the demand function

(4 marks)

Question 8

(a)   Convert $Z = 5 \angle 210°$ into Cartesian form.

(4 marks)

(b)   Differentiate $f(t) = \dfrac{\sqrt[5]{(t^3 + t)}}{(-t)}$.

(8 marks)

(c)   Determine the critical point(s) for the curve $f(x) = x^4$

(8 marks)

Question 9

(a)   Lim Saw Chin purchased a new small boat by trading his old boat which was valued at RM6000. He had to make an additional payment of RM3000 as down payment. He paid RM1000 every month for three years. The interest rate charged was 12% per annum on the original balance. Determine

   i.   the instalment price of the new boat.

(4 marks)

   ii.   the cash price of the new boat.

(4 marks)

(b)   Isfahis bought a second hand luxury car worth RM95000 on an installment basis in which he charged 3.5% per month on any outstanding balance. She made 15.8% from the cash price as a down payment and paid RM7168 every two weeks. When the instalment payments just entered into the fourth payment according to the schedule, the rate charge reduce about 1.45% and increase his monthly payment up to 3.8% then the normal instalment. Only in the sixth payment, he add about 5.7% from current payment as monthly instalment payment. But in this period, the current interest rate is increasing into 6% after replacing the old interest rate with GST rate. Determine the number of payments he made and the value of the final payment. Construct a repayment schedule.

(12 marks)

Question 10

(a)   Describe the different between declining balance method and sum of year digit method.

(4 marks)

(b)   Kavina wants to sell her minivan which was purchased for RM120000 after using it for four years. The residual value after eight years was estimated to be RM40000. Two second-hand car dealers offered to sell her car based on the book value. Rizal's Car

Choice used the declining balance method, while Keat's Car Shop used the sum of year digit method to calculate the depreciation of the car.

i. Determine the book value of the car after 4 years for both companies.

(12 marks)

ii. Which car dealer offers a better deal to Kavina? State your reason.

(4 marks)

Question 11

(a) Azfar's tax payable after deducting a personal tax rebate is RM53. Assess his chargeable income.

(5 marks)

(b) Zalina and his husband already married for 20 years but separately declare their income to LHDN for taxation record. Recently, they decided to combine their income for assessing tax payable in this year. Table 4 below shows the list of their income in year 2015.

Table 4: Zalina and her husband list of income and tax deductions for 2015

Item	Zalina	Husband
Salary	RM 48,000	RM 68,000
Commission (side business)	RM 2,300	RM 7,400
Novel Writer (royalties)	RM 6,000	-
Homestay	-	RM 9,800
Employees Provident Fund (EPF)	5%	7%
Life Insurance Premium (LIP)	3%	4%
SSPN (monthly)	RM 150	RM 260

Asus Desktop Computer	-	RM 3,300
Pa & Ma Magazines	RM 48	-
International Maritime Journal	-	RM 4,600
Furnish the Public Library at Manjung and Seri Iskandar	RM15,700	RM 21,400
Medical treatment for parents at Pantai Hospital	RM 4,000	RM 2,500
Medical examination	RM 5,500	-
Broadband	-	RM 550
Part-time study (Professional Certification in Culinary)	RM 7,000	-

They have five children's, three of them are studying at Chempaka International School (Kuala Lumpur), University Malaysia Perlis (Arau) and Yonsei University (South Korea). The child who studies at oversea is a handicapped children. The rest of children currently study at Kuala Nerang MARA matriculation with the last one is already working at Singapore. Both Zalina and her husband respectively contributes about 4.5% from their total income (chargeable income) to zakat. Assess their tax payable.

(15 marks)

END OF QUESTION

FORMULAE OF BUSINESS MATHEMATICS 2

DIFFERENTIATION

STANDARD FORM	GENERAL FORM
$\dfrac{d}{dx}\ln x = \dfrac{1}{x}$	$\dfrac{d}{dx}\ln f(x) = \dfrac{f'(x)}{f(x)}$
$\dfrac{d}{dx}e^x = e^x$	$\dfrac{d}{dx}e^{f(x)} = f'(x)e^{f(x)}$

INTEGRATION

STANDARD FORM	GENERAL FORM Where : $f(x) = ax + b$
$\displaystyle\int e^x dx = e^x + c$	$\displaystyle\int e^{f(x)}\,dx = \dfrac{e^{f(x)}}{f'(x)} + c$
$\displaystyle\int \dfrac{1}{x}dx = \ln|x| + c$	$\displaystyle\int \dfrac{1}{f(x)}dx = \dfrac{\ln|f(x)|}{f'(x)} + c$

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

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

$$= Cost \times depreciation\ rate$$

$$= Cost - Salvage\ Value$$

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

TAXATION

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

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

INSURANCE

$$Annual\ Pr\,emium = \frac{Amount\ of\ cov\,erage}{\$100} \times rate$$

FINANCIAL STATEMENTS

Net Sales = total sales – sales returns and allowances

Cost of goods sold = beginning inventory + purchases – ending inventory

Gross profit = net sales – cos t of goods sold

Net income = gross profit – operating exp enses

RATIO MANAGEMENT

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

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

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

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

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

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

Personal Income Tax Schedule

CATEGORY	RANGE OF TAXABLE INCOME		CHARGEABLE INCOME (RM)	RATE	TAX(RM)
A	0-2500	on the first	2500	0%	0
B	2501-5000	on the next	2500	1%	25
C	5001-10000	on the first	5000		25
		on the next	5000	3%	150
D	10001-20000	on the first	10000		175
		on the next	10000	3%	300
E	20001-35000	on the first	20000		475
		on the next	15000	7%	1050

F	35001-50000	**on the first**	**35000**		**1525**
		on the next	15000	12%	1800
G	50001-70000	**on the first**	**50000**		**3325**
		on the next	20000	19%	3800
H	70001-100000	**on the first**	**70000**		**7125**
		on the next	30000	24%	7200
I	More than 100000	**on the first**	**100000**		**14325**
			Each additional ringgit	26%	