UNIVERSITI KUALA LUMPUR
MALAYSIAN INSTITUTE OF MARINE ENGINEERING TECHNOLOGY

FINAL EXAMINATION
JANUARY 2017 SEMESTER

COURSE CODE	:	LGB11203
COURSE NAME	:	BUSINESS MATHEMATICS 2
PROGRAMME NAME (FOR MPU: PROGRAMME LEVEL)	:	BACHELOR OF MARITIME OPERATIONS (HONS)
DATE	:	07/07/2017 FRI
TIME	:	9.00 AM - 12.00 PM
DURATION	:	3 HOURS

INSTRUCTIONS TO CANDIDATES

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

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

3. This question paper consists of TWO (2) sections; Section A and Section B. Answer ALL questions in Section A and THREE (3) questions from Section B.

4. Please write yours answers on the answer booklet provided.

5. Write your answers only in BLACK or BLUE ink.

6. Answer all questions in English.

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)   Determine the real and imaginary parts of $Z = 5 \angle 220°$.

(4 marks)

(b)   Differentiate $P(d) = \left(d^2 - 1\right)^{-2}$.

(3 marks)

Question 2

(a)

> • Purchased RM2699 laptop
> • Payback RM350 per month
> • Charge of $2\frac{1}{2}\%$ interest on unpaid balance

Figure 1: Detail of purchasing and payment using credit card

From the information given in Figure 1, determine the outstanding balance at the end of the month.

(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 for managing their credit cards.

(3 marks)

Question 3

(a)   State and explain the main purpose of collecting individual income tax.

(2 marks)

(b)   From the following shopping list as shown in Figure 2, calculate the total goods and services tax (GST). (Hint: Food items are excluded from sales tax, which is 6%).

- Meat – RM36.10
- Fish cake – RM2.50
- Facial wash – RM8.99
- Salt – RM1.99
- Lettuce – RM0.75
- Shampoo – RM 7.50
- Orange juice – RM3.29
- Laundry detergent – RM19.99

Figure 2: List of goods

(4 marks)

Question 4

(a)   The book values of an automation machine after the third year and the fifth year using the straight line method are RM9000 and RM5000 respectively. Calculate the annual depreciation of the asset.

(4 marks)

(b)   A technician obtained a loan from his company to purchase a notebook which costs RM1899. To settle the loan, he has to make 30 monthly payments of RM83 each. However 10 months before the final payment, he wants to settle the loan in full. Calculate the total amount he has to pay.

(6 marks)

Question 5

Briefly explain the revenue, gross profit and net income status for Company A as shown in Figure 3. Determine whether financial of Company A is in good condition or not.

Income Statement

Period Ending	Jan 31, 2010	Jan 31, 2009
Total Revenue	408,214,000	404,374,000
Cost of Revenue	304,657,000	304,056,000
Gross Profit	103,557,000	100,318,000
Operating Expenses		
Research Development	-	-
Selling General and Administrative	79,607,000	77,520,000
Non Recurring	-	-
Others	-	-
Total Operating Expenses	-	-
Operating Income or Loss	23,950,000	22,798,000
Income from Continuing Operations		
Total Other Income/Expenses Net	181,000	284,000
Earnings Before Interest And Taxes	24,131,000	23,082,000
Interest Expense	2,065,000	2,184,000
Income Before Tax	22,066,000	20,898,000
Income Tax Expense	7,139,000	7,145,000
Minority Interest	(513,000)	(499,000)
Net Income From Continuing Ops	14,927,000	13,753,000
Non-recurring Events		
Discontinued Operations	(79,000)	146,000
Extraordinary Items	-	-
Effect Of Accounting Changes	-	-
Other Items	-	-
Net Income	14,335,000	13,400,000
Preferred Stock And Other Adjustments	-	-
Net Income Applicable To Common Shares	14,335,000	13,400,000

Figure 3: Income statement of Company A

(8 marks)

Question 6

The facts as shown in Figure 4 are for Company B Sdn Bhd. Calculate the inventory turnover at retail and inventory turnover at cost.

- 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

Figure 4: Income statement detail for Company B Sdn Bhd

(4 marks)

PART B (Total: 60 marks)

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

Question 7

(a) Given that $Z_1 = 2 - i$ and $Z_2 = -5 + 3i$, simplify $\dfrac{Z_1}{Z_2}$.

(4 marks)

(b) Differentiate $f(x) = (x^3 + 1)^3 (2 - 3x)$.

(8 marks)

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

(8 marks)

Question 8

(a) Lisa purchased a new boat by trading her old boat which was valued at RM5000. She had to make an additional payment of RM4000 as down payment. She paid RM1000 every month for three years. The interest rate charged was 12% per annum on the original balance. Determine the cash price of the new boat.

(8 marks)

(b) Kalairani 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. Car Shop A used the declining balance method, while Car Shop B used the sum of year digit method to calculate the depreciation of the car. Calculate the book value of the minivan after 4 years for both companies. Then, determine which agent should Kalairani choose to sell her minivan?

(12 marks)

Question 9

(a) Aisha's tax payable after deducting a personal tax rebate is RM125. Assess his chargeable income.

(5 marks)

(b) Johan and his wife 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 1 below shows the list of their income and tax deduction in the year 2016.

Table 1: Johan and his wife list of income and tax deductions for 2016

Item	JOHAN	WIFE
Salary	RM 93,000	RM 50,000
Commission (side business)	RM 2,300	RM 7,400
Employees Provident Fund (EPF)	11% per month	8% per month
PERKESO	RM19.20 per month	RM 17.50 per month
Education Insurance Premium	RM150 per month	-
SSPN (monthly)	RM 150	RM 260
DELL Laptop	-	RM 2,300
Pa & Ma Magazines	RM 48	-
International Mechanical Engineering Journal	-	RM 4,200
Medical treatment for parents at Pantai Hospital	RM 4,000	RM 2,500
Medical examination (Johan only)	RM 750	-
Part-time study (Professional Certification in Culinary)	RM 7,000	-
Tennis racket	RM 150	-
Tennis ball	RM48	

They have five children: three of them are studying at City Harbour International School (Seri Manjung), University Sains Malaysia (Penang) and Saint Petersburg State University (Rusia) respectively. The rest of children currently study at Kuala Nerang MARA matriculation with the last one is already working in Singapore. Both Johan and his wife respectively contributes about 4% from their total income to zakat. Assess their tax payable.

(15 marks)

END OF EXAMINATION PAPER

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

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

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

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

DEPRECIATION

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

$$= Cost \times depreciation\ rate$$

$$= Cost - Salvage\ Value$$

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

TAXATION

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

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

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

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

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

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

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

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

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

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%	