FINAL
ALTERNATIVE ASSESSMENT

(COVER PAGE)

Session	:	**April 2021**
Programme	:	Diploma in Business (DIB) Diploma In Finance (DIF/DFIN) Diploma In Marketing (DMKT) Diploma In Entrepreneurship (DENT) Diploma In Accounting (DIAN)
Course	:	**MAT1106: Business Mathematics**
Date of Examination	:	August 1, 2021 (Sunday)
Time	:	12.00 noon – 2.30 pm Reading Time : Nil
Duration	:	2 Hours : 30 Minutes

Note: 30 minutes is added into the duration of the examination to factor in any connectivity matters and for you to scan and upload your scripts.

Special Instructions :

This paper consists of **ALL FIVE (5)** questions.

Materials permitted :

Non-Programmable Calculator

Materials provided :

Nil

Examiner(s)	:	**Dinesh Kumar Govindasamy,** Dr Narinderjit Singh, Billy Siew Woo Bing, Taamaraiselvi Chinathamby and Chong Mee Teng
Chief Moderator	:	Goh Chok Huat

*This paper consists of **5** printed pages, including the cover page*

DIPLOMA IN BUSINESS (DIB)
DIPLOMA IN FINANCE (DIF/DFIN)
DIPLOMA IN MARKETING (DMKT)
DIPLOMA IN ENTREPRENEURSHIP (DENT)
DIPLOMA IN ACCOUNTING (DIAN)
MAT1106: BUSINESS MATHEMATICS
FINAL ALTERNATIVE ASSESSMENT: APRIL 2021 SESSION

Instructions: This paper consists of **FIVE (5)** structured-type questions. Answer **ALL** the questions hand written in either **BLUE/BLACK** ink on foolscap papers. Hence, upload the answers **(PDF FORMAT)** in Blackboard by using **TINY SCANNER/CAM SCANNER.**

Question 1

(a) Ms. Jane is a lawyer by profession and she has been saving every month a fixed amount of money in an investment account for the past 3 years. The table below shows the monthly deposits that were made in 2017, 2018 and 2019.

Year	**Monthly deposits (RM)**
2017	*RM 500*
2018	*RM 550*
2019	*RM 600*

Find the accumulated amount of Ms. Jane's investment at the end of 2019 if she was offered 12% interest compounded monthly. (15 marks)

(b) Mr. Paul plans to buy a condominium worth RM 1.2 million located in Mount Kiara with a 10% down payment towards financing the house. Determine the monthly installment of the housing loan, if he was offered 3.75% interest compounded monthly for 30 years.
(5 marks)
[Total: 20 marks]

Question 2

The data below shows the historical share price of Hong Leong Bank Bhd (HLBB) for the past 10 months. Obtain a trend value for this data using exponential smoothing with a smoothing constant of $\alpha = 0.2$. Hence, find the forecasted share price for the month of June 2021. *(Please show all steps clearly and round the forecasted figure to 2 decimal places)*.

Month	**Price (RM)**	**Forecast ($\alpha = 0.2$)**	**Forecast Error**
Aug 2020	14.00		
Sept 2020	15.04		
Oct 2020	14.80		
Nov 2020	17.18		
Dec 2020	18.20		
Jan 2021	17.26		
Feb 2021	18.00		
Mar 2021	18.70		
Apr 2021	17.82		
May 2021	17.66		

(20 marks)

[Total: 20 marks]

Question 3

Vivien is a professional photographer by profession. 6 years ago, Vivien deposited RM 10,000 in *XYZ Bank* earning a 2.5% interest compounded monthly. At the same time Vivien deposited RM 500 once in every two months *LION Bank* earning 3% interest compounded bi-monthly.

(a) Determine Vivien's total accumulated savings in both banks at the end of 6th year. Hence find the interest earned in *XYZ Bank's* account. (9 marks)

(b) Vivien plans to buy a new professional photographer's camera and accessories that are listed in the table below. She decided to use 50% of her total savings in purchasing the products and for the balance, she plans to take up a personal loan from a financial institution. Determine the monthly installment on her personal loan if she was offered 5% interest compounded monthly for 3 years. (6 marks)

Products	**Price**
Nikon D6 DSLR Camera (Body Only)	RM 31,888
Nikon AF-S Tele converter TC-20E III	RM 2,068
Nikon SU-800 Wireless Speedlight Commander Unit	RM 1,232
Nikon AF-S NIKKOR 500mm f/5.6E PF ED VR Lens	RM 17,598
Total	***RM 52,786***

(c) Find the accumulated amount of Vivien's remaining savings if she invested all her savings in an account that pays 2.7% interest compounded monthly for the next 5 years. Hence, find the interest earned. (5 marks)

[Total: 20 marks]

Question 4

A DSLR camera manufacturer assembles and sells x units of professional camera per month. The revenue, cost and price functions are given as below:

$$\boldsymbol{Revenue: R(x) = 90,000x - 0.2x^2}$$
$$\boldsymbol{Cost: C(x) = 40,000 + 30,000x}$$
$$\boldsymbol{Price: p(x) = 90,000 - 0.2x}$$

(a) Determine the maximum monthly revenue and the number of units of DSLR camera that should be sold to achieve the maximum monthly revenue.
(5 marks)

(b) Find the price of each DSLR camera to be sold to achieve its maximum revenue. (2 marks)

(c) Find the profit function. (2 marks)

(d) Determine the maximum monthly profit and the number of units of DSLR camera that should be sold to achieve maximum monthly profit.
(5 marks)

(e) Find the price of DSLR camera to be sold to achieve its maximum profit. (2 marks)

(f) Find the quantity of DSLR camera to be sold to break-even. (4 marks)

[Total: 20 marks]

Question 5

(a) Jason bought a DSLR camera for RM 45,000. After 5 years, the price of his camera depreciated to RM 29,000.

(i) Find the equation that satisfy the above information where the value of DSLR camera is dependent on its age. (5 marks)

(ii) Determine the value of the DSLR camera at the end of 6^{th} year. (2 marks)

(iii) Find the age of the DSLR camera when it has no value. (2 marks)

(iv) Interpret the slope and the y-intercept of the equation found in question 5(a)(i). (4 marks)

(b) Mr. Foo intends to use moving average to observe the trend of one of his stock. He obtained the share price of his stock for the past 7 months, from NOV 2020 to MAY 2021 as stated in the table below.

Month	**NOV 2020**	**DEC 2020**	**JAN 2021**	**FEB 2021**	**MAR 2021**	**APR 2021**	**MAY 2021**
Share price (RM/unit)	*12.52*	*11.60*	*12.10*	*12.32*	*12.90*	*13.38*	*13.65*

(i) Use a 3-month moving average of the share prices to forecast for the month of APR 2021 and find the forecast error. *(Please round the forecasted figures to 2 decimal places)*. (3 marks)

(ii) Use a 5-month moving average of the share prices to forecast for the month of MAY 2021 and find the forecast error. *(Please round the forecasted figures to 2 decimal places)*. (4 marks)

[Total: 20 marks]

~THE END~