



FINAL EXAMINATION
MARCH 2024

COURSE TITLE	RISK MANAGEMENT FOR FINANCIAL INSTITUTIONS
COURSE CODE	TECO3343
DATE/DAY	24 JUNE 2024 / MONDAY
TIME/DURATION	02:00 PM - 04:00 PM / 02 Hour(s) 00 Minute(s)

INSTRUCTIONS TO CANDIDATES :

1. Please read the instruction under each section carefully.
2. Candidates are reminded not to bring into examination hall/room any form of written materials or electronic gadget except for stationery that is permitted by the Invigilator.
3. Students who are caught breaching the Examination Rules and Regulation will be charged with an academic dishonesty and if found guilty of the offence, the maximum penalty is expulsion from the University.

(This Question Paper consists of 3 Printed Pages including front page)

*****DO NOT OPEN THE QUESTION PAPER UNTIL YOU ARE TOLD TO DO SO*****

There are TWO (2) questions in this examination paper. Answer ALL questions on the answer booklet provided. [100 MARKS]

Question 1

(60 Marks)

Bank ABC holds a portfolio that consists of five loans. Each of these loans has a default probability of 2% and the performance of each of the loans is completely independent of each other.

- a) Compute the probability of observing exactly two loans to default. (Hint: Make use of an appropriate formula contained in the formula sheet). (8 marks)
- b) Compute the probability of observing two or fewer loans to default. (Hint: Make use of an appropriate formula contained in the formula sheet). (12 marks)
- c) The loan outstanding balance during default and the recovery rate along with its variance is given by Table 1 below for each loan.

Table 1: Exposure at default (EAD) and Recovery rate

	Exposure at Default (EAD) RM	Recovery Rate %
Loan 1	120,000	15%
Loan 2	150,000	12%
Loan 3	130,000	25%
Loan 4	180,000	20%
Loan 5	220,000	28%

Compute the expected loss (EL) of the portfolio. (18 marks)

- d) After one year, three of the five loans have matured, leaving only Loan 1 and Loan 2. Assuming that the variance of loss given default for Loan 1 and Loan 2 are 0.023 and 0.035, respectively, compute the unexpected loss for the portfolio (which now consists of only two loans).
(Hint: Make use of an appropriate formula contained in the formula sheet). (12 marks)
- e) One of the many ways Bank ABC can mitigate the credit loss of Loan 1 and Loan 2 is to purchase credit protection using the credit default swap (CDS). Explain how CDS works. (10 marks)

Question 2

(40 Marks)

Banks are known to have high leverage, which means that bank owners merely need to put in a small amount of money to generate a high volume of interest-earning assets. However, a higher leverage will entail a higher amount of risk.

Bank XYZ is one of the many banks that exploit the leverage effect by merely putting in an equity of RM20 million but generate a high amount of interest-earning assets of RM100 million.

- a) Describe the relationship between leverage effect and funding liquidity risk. (10 marks)

- b) If the asset return for Bank XYZ is 5%, while its average cost of debt (inclusive of interest paid on deposit) is 3%, compute its return on equity (ROE). (Hint: Make use of an appropriate formula contained in the formula sheet). (8 marks)
- c) If the amount of equity for Bank XYZ increases by RM20 million without reducing its debt (or other liabilities), compute its new ROE. Explain the relationship observed between ROE and leverage effect. (8 marks)
- d) Assuming Bank XYZ holds the following securities, too:

	Volume	Bid Price	Offer Price
Security A	1,000,000	RM50.50	RM52.00
Security B	1,200,000	RM48.50	RM50.50

- i. Compute the liquidation cost for Bank XYZ if it were to liquidate the above positions. (Hint: Make use of an appropriate formula contained in the formula sheet). (6 marks)
- ii. Which of the two securities is likely to be traded in a less liquid market? (3 marks)
- iii. How is Bank XYZ affected by holding a less liquid asset? (5 marks)

Appendix: Formula Sheet

$$P(X = x) = \frac{n!}{(n-x)!x!} p^x q^{(n-x)}$$

$$UL_i = EAD_i * \sqrt{PD_i * \sigma_{LR_i}^2 + LR_i^2 * \sigma_{PD_i}^2}$$

$$UL_p = \sqrt{UL_i^2 + UL_j^2 + 2 * \rho * UL_i * UL_j}$$

$$r_E = L * r_A - (L - 1) * r_D$$

$$LC = \sum_i^n \frac{\text{proportional bid - offer spread}_i * \text{mid market value}_i}{2}$$

*** END OF QUESTION PAPER ***