



SIR ARTHUR LEWIS COMMUNITY COLLEGE
ACADEMIC YEAR (2024/2025) – SEMESTER TWO
END OF SEMESTER EXAMINATION

COURSE CODE : MAT108
COURSE TITLE : Mathematics for Finance
LECTURER(S) : Titus Mathurin
DATE : May 5, 2025
TIME : 1 p.m.
DURATION : 2 Hours
STUDENT ID # : _____

GENERAL INFORMATION AND INSTRUCTIONS

- Students must sign **IN** and **OUT** on the examination class list.
- This Examination Paper consists of **Two (2)** Sections spread over four (4) pages. All **SECTIONS** are **Compulsory**. **Section A** comprises **fifteen (15) multiple choice questions** while **Section B** comprises of **four (4) structured response questions**. **SECTIONS A** accounts for **fifteen (15) marks** while **SECTION B** accounts for **45 marks**. **Total marks = 60**.
- ***LENDING OR BORROWING IS PROHIBITED.***
- Please number your responses accurately
- Write your ID Number on *each* answer sheet
- All cell phones must be turned off during the examination
- Programmable calculators are not allowed in this exam.

Simple Interest Formulas:

$$\text{Simple Interest} = Prt$$

$$\text{Future Value} = P(1 + rt)$$

$$\text{Present Value} = \frac{FV}{(1+rt)}$$

Compound Interest Formulas:

$$\text{Future Value} = P(1 + i)^n$$

$$\text{Present Value} = \frac{FV}{(1 + i)^n}$$

Ordinary Annuity Formulas:

$$\text{Future Value} = R \left[\frac{(1+i)^n - 1}{i} \right]$$

$$\text{Present Value} = R \left[\frac{1 - (1+i)^{-n}}{i} \right]$$

Annuity Due Formulas:

$$\text{Future Value} = R \left[\frac{(1+i)^n - 1}{i} \right] * (1 + i)$$

$$\text{Present Value} = R \left[\frac{1 - (1+i)^{-n}}{i} \right] * (1 + i)$$

DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO

SECTION A

Instruction: Circle the letter of correct answer on the answer sheet provided.

1. If the interest per quarter is 4%. The interest rate per annum is:
 - A. 1%
 - B. 16%
 - C. 4%
2. The amount that is written on a banknote is called:
 - A. Maturity Value
 - B. Proceeds
 - C. Face Value
3. All the following are regional financial institutions except:
 - A. Republic Bank Limited
 - B. RBC Royal Bank
 - C. CIBC Limited
4. The value of a non-interest-bearing promissory note is recorded at the:
 - A. Start date
 - B. Maturity date
 - C. Discount date
5. What type of annuity deals with regular payments being made at the beginning of a period?
 - A. Annuity Due
 - B. Ordinary Annuity
 - C. Annuity Certain
6. Determine the exact number of days between June 5th, 2020 and April 29th, 2025.
 - A. 1,789 days
 - B. 1,800 days
 - C. 1,880 days
7. What is the position/condition that occurs at any focal date when dealing with simple or compound interest?
 - A. Total revenues = Total costs
 - B. Total value of loans = Total value of payments
 - C. Total value of payments = Total value of sales
8. What type of cost changes based on the number of units produced?
 - A. Total Fixed cost
 - B. Variable cost per unit
 - C. Total variable cost
9. In the long-run, fixed cost is expected to _____.
 - A. Change
 - B. Remain the same
 - C. Doesn't exist
10. Interest is calculated by:
 - A. Present value plus future value
 - B. Future value minus present value
 - C. Present value minus future value
11. Graphically, the break-even point exists when the _____.
 - A. Total cost line intercepts the total variable line.
 - B. Total variable line intercepts the Total revenue line.
 - C. Total cost line intersects the Total revenue line.

Refer to the statement provided below to answer questions 12 - 15:

Selling price per unit	\$17
Variable Cost per unit	\$7
Fixed Cost	\$4,000
Capacity	1000 units

12. If 75% of the capacity is produced and sold, what is the firm's cost?
- A. \$12,750.00
 - B. \$9,250.00
 - C. \$11,000.00
13. State an expression to represent the firm's profit function.
- A. $10x - 4000$
 - B. $10x + 4000$
 - C. $10x$
14. If a firm wishes to make a revenue of \$13,787.00, how many units must be sold?
- A. 729
 - B. 679
 - C. 811
15. At what level of output will the firm break-even?
- A. 400
 - B. 1000
 - C. 500

SECTION B

Instructions: Answer all questions on the foolscap provided.

1. Jackie took a loan from FICS of \$5,400.00 nine months ago at a simple interest of 6% p.a. This loan must be repaid by making two equal payments of \$ x at a simple interest of 8% p.a. The first payment was made six months ago and the second payment, six months from now. If the agreed focal date is now, use the information provided to perform the following tasks:
- a. Draw a well labeled timeline to represent the information. **[3 marks]**
 - b. Determine the length of time, in years, for all Jackie's loan to reach the focal date. **[1 mark]**
 - c. Determine the length of time, in years, for each of Jackie's payments to reach the focal date. **[2 marks]**
 - d. Calculate the value of Jackie's loan at the focal date. **[3 marks]**
 - e. Calculate the total value of Jackie's payments at the focal date. **[5 marks]**
 - f. State the condition that exists at the focal date. **[1 mark]**
 - g. Determine the value of the unknown payments that Jackie has to make to repay the loan she took from FICS at the agreed upon focal date **[2 marks]**

2. A six and a half year, interest-bearing promissory note with a maturity value of \$10,000.00 is to be discounted forty-five (45) months before its maturity date at 11.5% compounded semi-annually.
 - a. Calculate the values for i and n . **[2 marks]**
 - b. Determine the proceeds of the note at the discount date. **[3 marks]**

3. TJ has set up a Mutual fund. The term of the fund is that he is required to deposit \$500.00 at the end of every fortnight into an account that pays interest at 5.5% p.a. compounded fortnightly for the next three (3) years. Thereafter, he is expected to leave the money in the same account requiring no future deposits for another year before he can withdraw from the fund. At that point in time, he will be paid a daily interest of 1.5%.
 - a. State the type of annuity presented in the above statement. **[1 mark]**
 - b. Draw a timeline to represent the above information. **[2 marks]**
 - c. Calculate the values for i and n for the first three years. **[2 marks]**
 - d. Calculate the values for i and n for the last year. **[2 marks]**
 - e. How much of TJ's money will be deposited into the mutual fund altogether? **[2 marks]**
 - f. Calculate the amount of money in the mutual fund after the first three years. **[3 marks]**
 - g. Calculate the amount of money that TJ will be able to withdraw from the fund after four years. **[3 marks]**

4. Peter took a loan valued at \$8,250.00 from BOSL Limited at interest 12.6% p.a. compounded monthly to be repaid by making regular monthly payments of \$1,725.00.
 - a. Prepare a loan amortization schedule for the above information. **[7 marks]**
 - b. How much time, in years, will it take to repay the loan? **[1 mark]**
 - c. How much interest is earned by BOSL from the loan to Peter? **[2 marks]**

END OF FINAL EXAMINATION