ΠΑΜΙΒΙΑ UΠIVERSITY
OF SCIEΠCE AΠD TECHΠOLOGY

Faculty of Health and Applied Sciences

Department of Mathematics and Statistics

QUALIFICATION: Bachelor of Science ; Applied Mathematics and Statistics	
QUALIFICATION CODE: 07BSAM	LEVEL: 5
COURSE: FINANCIAL MATHEMATICS 1	COURSE CODE: FIM502S
DATE: November 2022	SESSION: Theory
DURATION: 3 Hours	MARKS: 100

FIRST OPPORTUNITY EXAM QUESTION PAPER	
EXAMINER(S)	Dr Victor Katoma
MODERATOR:	Prof Samuel Eegunjobi

THIS QUESTION PAPER CONSISTS OF 2 PAGES

(Excluding this front page)

INSTRUCTIONS

1. Answer ALL the questions.
2. Write clearly and neatly.
3. Number the answers clearly.

PERMISSIBLE MATERIALS

1. Non-programmable pocket calculator without the cover

QUESTION 1 (25 MARKS)

1.1 Explain/define the following:

      1.1.1   Amortisation of a Loan repayment   (5)

      1.1.2   Annuity   (2)

      1.1.3   Deferred annuity   (2)

2.1 Rudy buys a piece of land for N$110,000. He makes 20% down payment and for the balance he takes a loan for 25 years that charges an annual interest rate of 5% compounded monthly. Find the

      1.2.1 Monthly payments   (6)

      1.2.2 Total amount of interest that will be paid   (5)

      1.2.3 Amount of the loan that he would have paid after 10 years   (5)

QUESTION 2 (25 MARKS)

2.1   Show that $a_{n]} = \frac{1-(v)^n}{i}$ (6)

2.2   Mr Kandji has purchased a farm worth N$50,000 through the bank. He has decided to pay back the loan in yearly instalments in **arrears** over 5 years. If money is worth 8% p.a., schedule these payments on an amortization schedule.   (15)

2.3   Use $a_{n]}$ to prove that after a third (3) payment the Loan balance is N$ 22,331.51   (4)

QUESTION 3 (25 MARKS)

3.1   What is time value of money?   (2)

3.2   Anna set up an annuity to save for her retirement. She arranged to have N$800 taken out of each of her monthly wages and deposited into this account; it will earn annual interest of 4.5% compounded monthly. She just had her thirtieth birthday, and her ordinary annuity comes to term when she is sixty-five. Find the following

      3.2.1 The future value of the account   (7)
      3.2.2 Anna's total contribution to the account   (3)
      3.2.3 The total interest earned   (3)

3.4 After making a down payment of N$4000 for an automobile, Murphy paid N$400 per month for 36 months with interest charged at j_{12} = 12% on the unpaid balance

3.4.1 What was the original cost of the car? (6)

3.4.2 What part of Murphy's total car payments went toward interest charges? (4)

QUESTION 4 (25 MARKS)

4.1 At what interest rate (compounded continuously) would an investment C_0 centuple (100 times) in 25 years? (4)

4.2 Prove that $\ddot{S}_{n]} = \frac{(1+i)^n - 1}{d}$ (5)

4.3 Define the following

    4.2.1 Sinking fund (3)

    4.2.2 Perpetuity (2)

    4.2.3 Accumulation factor (3)

    4.2.4 Force of interest (3)

4.4 Show that $\ddot{a}_{n]} = \frac{1-(v)^n}{d}$ (5)

--END OF EXAMINATION—

KEEP
CALM
AND
GOOD
LUCK