



NAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY
FACULTY OF HEALTH AND APPLIED SCIENCES

DEPARTMENT OF MATHEMATICS AND STATISTICS

QUALIFICATION: Bachelor of science; Bachelor of Science in Applied Mathematics and Statistics	
QUALIFICATION CODE: 07BOSC; 07BAMS	LEVEL: 5
COURSE CODE: FIM502S	COURSE NAME: FINANCIAL MATHEMATICS 1
SESSION: JANUARY 2020	PAPER: THEORY
DURATION: 3 HOURS	MARKS: 100

SECOND OPPORTUNITY/SUPPLEMENTARY EXAMINATION QUESTION PAPER	
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MODERATOR:	DR A EEGUNJOBI

INSTRUCTIONS
<ol style="list-style-type: none">1. Answer ALL the questions in the booklet provided.2. Show clearly all the steps used in the calculations.3. All written work must be done in blue or black ink and sketches must be done in pencil.

PERMISSIBLE MATERIALS

1. Non-programmable calculator without a cover.

THIS QUESTION PAPER CONSISTS OF 3 PAGES (including this front page)

QUESTION 1 (25 MARKS)

1.1 What is amortization? [2]

1.2 An investor wishes to purchase a level annuity of N\$ 120 per annum payable quarterly in arrear for five years. Find the purchase price, given that it is calculated on the basis of an interest rate of 12% per annum

(a) Effective [4]

(b) Convertible quarterly [5]

1.3 Anita borrows an amount of N\$10, 000 and agrees to pay back this amount in 60 level monthly payments starting one month after the loan is signed. If money is worth $j_{12} = 0.06$,

1.3.1 compute the amount of interest Anita pays back [8]

1.3.2 evaluate the outstanding balance after 4 years [6]

QUESTION 2 (25 MARKS)

2.1 Mr Kandji has purchased a farm worth N\$50,000 through the bank. He has decided to pay back the loan in yearly instalments over 5 years in arrears. If money is worth 8% p.a, Schedule these payments on an amortization table [12]

2.1.1 Use $a_{\overline{n}|i}$ to prove that after a third (3) payment the Loan balance is N\$ 22,331.51 [5]

2.2 Given that $i = 0.08$, find the values of $i^{(12)}$, $d^{(4)}$, and δ . [8]

QUESTION 3 (25 MARKS)

3.1 Explain/define the following:

3.1.1 Sinking Funds [4]

3.1.2 Annuity [2]

3.1.3 Deferred annuity [3]

3.2 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

3.2.1 Monthly payments. [6]

3.2.2 Total amount of interest that will be paid [5]

3.2.3 Amount of the loan that he would have paid after 10 years [5]

QUESTION 4 (25 MARKS)

4.1 If N\$ 50 is invested at time 2 and the accumulated amount at time 7 is N\$100.
Find $i_5(2)$. [5]

4.2 A loan of N\$ 100 000 is being considered over a term of 10 years at an interest rate of 9% p.a., with monthly repayments. Repayments on loan are made at the end of the Month, so this is annuity in arrears.

4.2.1 Construct an amortization table that shows the payments up to 6 months. [8]

4.2.2 Calculate the total amount paid over the 10 years [3]

4.2.3 Calculate the total interest paid on the 25th Month [4]

4.2.4 Calculate the amount of principle outstanding after 25th month [5]

—END OF EXAMINATION—