NAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY

Faculty of Health and Applied Sciences

Department of Mathematics and Statistics

QUALIFICATION: Bachelor of Science ; Applied Mathematics and Statistics	
QUALIFICATION CODE: 07BAMS	**LEVEL:** 5
COURSE: FINANCIAL MATHEMATICS 1	**COURSE CODE:** FIM502S
DATE: January 2019	**SESSION:** Theory
DURATION: 3 Hours	**MARKS:** 100

SECOND OPPORTUNITY EXAM QUESTION PAPER	
EXAMINER(S)	Dr Victor Katoma; Mrs Susan Mwewa
MODERATOR:	Dr 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 Show that $\ddot{a}_{\overline{n}|} = \frac{1-v^n}{d}$ (5)

1.2 A loan of N$10, 000 is to be repaid over 10 years by a level annuity payable monthly in arrears. The amount of the monthly payment is calculated on the basis of an interest rate of 1% per month effective. Find the

1.2.1 Monthly repayment. (4)
1.2.2 Total capital repaid and interest paid in the 1st and last year respectively. (6)
1.2.3 After which monthly repayment the outstanding loan is first less than N$5, 000. (5)
1.2.4 For which monthly repayment the capital repaid first exceeds the interest. (5)

QUESTION 2 (25 MARKS)

2.1 Define the nominal rates of interest (3)

2.2 Derive the compound interest formula from simple interest (7)

2.3 Deduce the continuous compounding formula from the compounding formula (10)

2.4 Show that $a_{\infty|} = \lim_{n\to\infty} a_{n|}$ ***= 1/i*** (5)

QUESTION 3 (25 MARKS)

3.1 Given that $\delta = 0.1$ find the values of

$$i^{(4)}, i^{(12)}, i^{(365)}, d^{(4)}, d^{(12)}, d^{(365)}$$ (12)

3.2 On 10 Jan in each of the years 1964 to 1979 inclusive, an investor deposited £5000 in a special bank savings account. On 10 Jan 1983, the investor withdrew his savings. Given that over the entire period the bank used an annual interest rate of 7% for its special savings accounts, find the sum withdrawn by the investor. (10)

3.4 Why do banks impose interest (3)

QUESTION 4 (25 MARKS)

4.1 Given that $d = 6\%$, compute the value of $i^{(12)}$ (9)

4.2 Prove that $S_{n]} = \frac{(1+i)^n - 1}{i}$ (7)

4.3 Define the following

4.3.1 Loan schedule (4)

4.3.2 Effective interest rates (5)

--END OF EXAMINATION—