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QUALIFICATION : **BACHELOR of SCIENCE IN APPLIED MATHEMATICS AND STATISTICS**	
QUALIFICATION CODE: **07BSAM**	LEVEL: **5**
COURSE: **FINANCIAL MATHEMATICS 1**	COURSE CODE: **FIM502S**
DATE: **NOVEMBER 2024**	SESSION: **1**
DURATION: **3 HOURS**	MARKS: **100**

FIRST OPPORTUNITY: EXAMINATION QUESTION PAPER

EXAMINER: ***Mrs. Hilma Yvonne Nkalle***

MODERATOR: ***Prof. Adetayo Samuel Eegunjobi***

INSTRUCTIONS:

1. Answer all questions on the separate answer sheet.
2. Please write neatly and legibly.
3. Do not use the left side margin of the exam paper. This must be allowed for the examiner.
4. No books, notes and other additional aids are allowed.
5. Mark all answers clearly with their respective question numbers.

PERMISSIBLE MATERIALS*:*

1. Non-Programmable Calculator

This paper consists of 3 pages including this front page

Question 1 [5 Marks]

An Investor wants to have N$ 25000 after 5 years. If they invest at an annual interest rate of 4%, how much should they invest now?

Question 2 [4 Marks]

If N$ 8500 is invested at an annual interest rate of 6.2% and the simple interest earned after some time is N$ 2635, how long was the money invested?

Question 3 [5 Marks]

A principal of N$ 10000 is invested at an annual interest rate of 6%, compounded quarterly, for four years. What is the total amount after 4 years?

Question 4 [6 Marks]

How long will it take for an investment of N$ 15000 to grow to N$ 25000 at an annual interest rate of 7%, compounded monthly?

Question 5 [6 Marks]

Derive the general formula for effective rate of interest of compound interest.

Question 6 [8 Marks]

Derive the general formula for accumulated amount (A) for compound Interest.

Question 7 [6 Marks]

You deposited N$ 2000 at the end of year into an account earning 6% annual interest. How much will you have in the account at the end of 10 years?

Question 8 [6 Marks]

You are set to receive N$ 2500 per quarter for 10 years, and the interest rate is 4% per year, compounded quarterly. What is the present value of this annuity?

Question 9 [6 Marks]

You want to accumulate N$ 100000 in 15 years by making annual contributions to an account that earns 5% interest per year. What is the annual payment required to reach your goal?

Question 10 [12 Marks]

Consider a loan of N$1000 borrowed at an effective rate of 12% payable yearly, with an equal payment over a period of 3 years. Suppose that the loan is repaid in equal payments. Set up an amortized schedules and do the calculations required.

Question 11 [6 Marks]

A saving plan allows you to save N$ 500 in the first month and increase your savings by N$ 100 each subsequent month. How much will you have saved in the first 12 months?

Question 12 [5 Marks]

Suppose you are saving money, where the first month's savings is N$500. You increase your savings by N$ 100 every month. Calculate the savings in the 10^{th} month.

Question 13 [5 Marks]

A company projects that its revenue will grow by 8% each year. If the revenue in the first year is N$ 50000, What will be the revenue in the fourth year?

Question 14 [6 Marks]

Saara borrowed N$50000 at an interest rate of 5% per year, and you will repay the loan in 10 annual instalments. Calculate the amount of each annual payment

Question 15 [5 Marks]

Douglas Invest N$ 20000 at an annual interest rate of 6%, compounded continuously. How much will the investment be worth in 10 years.

Question 16 [5 Marks]

You invest N$ 10000 in an account that offers continuous compounding at an annual rate of 7%, How long will it take for your investment to grow to N$ 30000?

Question 17 [4 Marks]

A bank offers a nominal annual interest rate of 6%, compounded quarterly. Calculate the affective interest rate (EIR).