NAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY
Faculty of Health, Applied Sciences &Natural Resources

Department of Mathematics and Statistics

QUALIFICATION : Bachelor of Technology : Accounting and Finance, Advanced Diploma in the Theory of Accounting, Bachelor of Accounting and Diploma in Accounting and Finance	
QUALIFICATION CODE: 23BACF ;07BACP; 06BDAF; 07ADTA	**LEVEL: 5**
COURSE: QUANTITATIVE METHODS	**COURSE CODE:** QTM511S
SESSION: July 2022	**PAPER: THEORY**
DURATION: 3 Hours	**MARKS: 100**

SUPPLEMENTARY /SECOND OPPORTUNITY EXAMINATION QUESTION PAPER	
EXAMINER(S)	**Mrs. H.Y. Nkalle**; Mrs. A. Sakaria; Dr. J. Ongala; Dr. D. Ntirampeba; Prof. A.S. Eegunjobi
MODERATOR:	**Dr. D.B. Gemechu**

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

PERMISSIBLE MATERIALS

1. Non-Programmable Calculator without the cover

ATTACHMENTS

2. Formula Sheet

THIS QUESTION PAPER CONSISTS OF 4 PAGES (Including this front page)

Question 1

A sum of money amounts to N$ 9800 after 5 years and N$ 12005 after 8 years at the same rate of simple interest. What is the rate of interest? [6]

Question 2

Adam needs N$7105.32 to pay for spray painting his BMW. The bank has offered to lend him money at a discount rate of 15% for 270 days. Calculate the face value of the loan if Adam is to get this exact amount from the bank. [3]

Question 3

Anna borrowed N$20 000 at 5% for three and half years. She wants to pay N$8000 on maturity. To achieve this, she is planning to pay 2000 in 10 months, 5000 in 16 months from now. How much should she pay in two and half years from now to meet her obligation? [10]

Question 4

Memanguluko took a loan of N$3000 on 01 January 2008 at 7% p.a. compounded half yearly. Calculate how much Memanguluko will pay on 20 July 2018. [5]

Question 5

Joshua paid N$2500 interest on N$5000 amount after 8 months. What is the nominal interest charged? If interest is compounded quarterly. [5]

Question 6

Maria wants to build her house at the village before she retires. She can afford payments of N$3500 per month and can borrow at 0.55% per month over 15 years. How much can she afford to borrow on a fully redeemable mortgage? [5]

Question 7

Ketu want to be able to withdraw N$7000 at the end of five years and withdraw N$4000 at the end of seven years leaving a zero balance in the account after the last withdrawal. If she can earn a simple interest of 6% p.a. on her balances, how much must she deposit in two years from now to satisfy her withdrawal needs? [8]

Question 8

A compound amount of N$ 10 000 is due in 5 years. Determine the equivalent value of the debt in 2 years from now, if money is worth 7% p.a. compounded twice a year. [5]

Question 9

Two thousand randomly selected adults were asked whether they have ever shopped on the internet. The following table gives a two-way classification of the responses

	Have Shopped(H)	**Have never Shopped(N)**
Male(M)	400	800
Female(F)	350	450

If one adult is selected at random from these 2000 adults, find the probability that this adult

9.1 Has never shopped on the internet [2]

9.2 Is a male [2]

9.3 Has shopped on the Internet given that this adult is a female [3]

9.4 Is a male or has never shopped on the Internet? [3]

9.5 Is a male or female [2]

9.6 Are the events "female" and "have shopped" independent? Explain? [2]

Question 10

The Namibia Statistical Agency reports on the total units of new privately owned housing started over a 16-year recent period is given below.

Year (s)	**Total Number of Units**
2000	1193
2001	1014
2002	1200
2003	1288
2004	1457
2005	1354
2006	1477
2007	1474
2008	1617
2009	1641
2010	1569
2011	1603

2012	1705
2013	1848
2014	1956
2015	2068

10.1 determine the trend line that best fit the data using the sequential numbering methods, start $x = 1$ [9]

10.2 use your best fit to approximate the sales value in 2016, 2017 and 2018 [6]

Question 11

The following table is a frequency table of the scores obtained in a QTM quiz competition.

Scores (Intervals)	Frequency(f)
10 -< 20	5
20 - < 30	7
30 - < 40	10
40 - < 50	16
50 - < 60	2

Find the:

11.1 Mean score [3]

11.2 Median score and [5]

11.3 Mode of score [5]

Question 12

Solve the following inequality

$$\frac{3}{4x+3} \leq \frac{2}{3} \leq \frac{2}{x+5}.$$ [8]

Question 13

Define the following terminology as applied in index numbers

(a) Index Number [3]

End of paper

Total marks: 100

Formula(s) sheet

$$I = prt$$

$$A = P(1 + rt)$$

$$t = \frac{N-1}{r} \; for \; N \geq 2$$

$$D = Adt$$

$$P = A(1 - dt)$$

$$D = A - P$$

$$r_{eff} = (1 + \frac{r}{m})^m - 1$$

$$A = P(1 + \frac{r}{m})^{mt}$$

$$r = \frac{d}{1-dt}$$

$$r_{eff} = \frac{r}{1-rt}$$

$$d = \frac{r}{1+rt}$$

$$t = \frac{logA - \log P}{m \; log \; (1+\frac{r}{m})}$$

$$t = \frac{\log 2}{m \log(1+\frac{r}{m})}$$

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

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

$$paasche = \left[\frac{\sum_{i=1}^{n}(p_1 \times q_1)}{\sum_{i=1}^{n}(p_0 \times q_1)}\right] \times 100$$

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$$s_x^2 = \frac{\sum_{i=1}^{n}(x_i - \bar{x})^2}{n-1} = \frac{\sum_{i=1}^{n} {x_i}^2 - n\bar{x}^2}{n-1}$$

$$s_x^2 = \frac{\sum_{i=1}^{n} f_i(x_i - \bar{x})^2}{n-1} = \frac{\sum_{i=1}^{n} f_i {x_i}^2 - n\bar{x}^2}{n-1}$$

$$M_k = I + \frac{h}{f}\left(\frac{kn}{4} - F\right)$$

$$M_o = l_{M_o} + \frac{f_1 - f_0}{2f_1 - f_0 - f_2} \times h$$

$$= I_{M_0} + \frac{f_1 - f_0}{(f_1 - f_0) + (f_1 - f_2)}$$

$$M_d = I_{M_d} + \frac{h}{f}\left(\frac{n}{2} - F\right)$$

$$\overline{x} = \frac{\sum_{i=1}^{n} f_i x_i}{\sum_{i=1}^{k} f_i}$$

$$P(B \backslash A) = \frac{P(A \cap B)}{P(A)}$$

$$b = \frac{n\sum xy - \sum x \sum y}{n\sum x^2 - (\sum x)^2}$$

$$a = \frac{\sum y - b\sum x}{n}$$

$$b = \frac{\sum xy}{\sum x^2}$$

$$a = \frac{\sum y}{n}$$

$$\bar{x} = \frac{\sum x_i}{n}$$

$$s_x = \sqrt{s_x^2}$$

$$CV = \frac{s_x}{\bar{x}} \times 100$$