TECHNICAL UNIVERSITY OF MOMBASA

School of Business

Department of Accounting & Finance

UNIVERSITY EXAMINATION FOR:

CERTIFICATE IN BUSINESS MANAGEMENT

CERTIFICATE IN BUSINESS ADMINISTRATION

CERTIFICATE IN PROCUREMENT AND MATERIAL MANAGEMENT

CERTICATE IN HUMAN RESOURCE MANAGEMENT

CERTIFICATE IN FRONT OFFICE AND OPERATIONS

CERTIFICATE IN SALES AND MARKETING

BAC 1103: BUSINESS CALCULATIONS

END OF SEMESTER EXAMINATION

SERIES: AUGUST 2024

TIME: 2 HOURS

DATE: Pick Date Aug2024

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID

This paper consists of **FIVE** questions. Attempt question ONE (Compulsory) and any other TWO questions.

Do not write on the question paper.

Question ONE

a) Giving an example in each case, differentiate between a "**scalar matrix**" and an "**identity matrix**"

(4 marks)

b) A certain company produced 20 units of product P and 40 units of product Q at a total cost of Sh. 10,800 in the month of March 2019. The company also produced 30 units of product P and 25 units of product Q at a total cost of Sh. 9,200 in the month of April 2019.

Required:

Using matrix al gebra, calculate the cost of producing a unit of product P and a unit of product Q. (10 Marks)

c) The table below shows the salaries earned by 104 employees of Excel Ltd, in the month of April 2021:

Monthly Salary sh. "000"	**No. of employees**
10 and under 15	10
15 and under 20	34
20 and under 25	42
25 and under 30	6
30 and under 35	6
35 and under 40	4
40 and under 50	2

Required:

i. The mean monthly salary (4 Marks)

ii. The median monthly salary (6 Marks)

iii. The standard deviation of the monthly salary (4 Marks)

iv. The coefficient of variation of the monthly salary (2 Marks)

Question TWO

a) Given, U (universal) = {0, 1, ……,9}, A = {2, 4, 6}, B = {1, 3, 5, 7}, C = {6, 7}. Find

(i) A′
(ii) A´ ∩ B.
(iii) (A ∪ B) ~ C,
(iv) (A ∪ C) ´
(v) (A ∩ U) ∩ (B ∩ C). (10 Marks)

b) Jennifer deposited money in a fixed deposit account that pays interest at the rate of 10% per annum for 5 years. She also deposited a certain amount of money in an investment account that pays interest at the rate of 15% p.a for the same period.

At the end of 5 years, Jennifer received Sh. 31, 285 and Sh. 68,070 from the fixed deposit account and the investment account respectively.

Required:

i. Simple interest of the two accounts. (4 Marks)
ii. Compound interest of each account. Assume interest is compounded quarterly. (6 Marks)

Question THREE

a) If the difference between T.D. and B.D. on a sum due in 4 months at 3% p.a. is sh. 10, find the amount of the bills. (6 marks)

b) Solve the inequality $\frac{2x-3}{5} \geq \frac{x}{2} - 1$ (4 Marks)

c) The publisher of a book pays author a lump sum plus an amount for every copy sold. If 500 copies are sold, the author would receive sh. 750 and for 1350 copies sh. 1175. How much would the author receive if 10000 copies are sold? (10 Marks)

Question FOUR

a) 10 years before, the ages of father and son was in the ratio 5: 2; at present their total age is 90 years. Find the present age of the son. (4 Marks)

b) Solve $(x^2 + 3x)2 + 2(x^2 + 3x) = 24$ (4 Marks)

c) Solve the inequality $4(x + 1) < 2x + 3$ (6 Marks)

d) If $p = \log_{10} 20$ and $q = \log_{10} 25$, find x and such that $2 \log_{10} (x + 1) = 2p - q$ (6 Marks)

Question FIVE

a) Differentiate between Null and Positive sets (4 Marks)

b) Below is the data distribution of income pertaining to 1500 employees of The Elephant's Hand Enterprises Ltd.

Income	18-20	20-22	22-24	24-26	26-28	28-30	30-32	32-34	34-36
Staff	10	35	140	300	370	320	200	75	35

Draw;

i. The histogram and (8 Marks)
ii. Frequency curve from the above data (8 Marks)