

The
Management
University
of Africa



Sponsored by the Kenya Institute of Management

CERTIFICATE UNIVERSITY EXAMINATIONS

SCHOOL OF MANAGEMENT AND LEADERSHIP

CERTIFICATE COMMON UNIT

CCU 103: BASIC CALCULATIONS AND STATISTICS

DATE: 29TH JULY 2026

DURATION: 2 HOURS

MAXIMUM MARKS: 70

INSTRUCTIONS:

1. Write your registration number on the answer booklet.
2. **DO NOT** write on this question paper.
3. This paper contains **SIX (6)** questions.
4. Question **ONE** is compulsory.
5. Answer any other **FOUR** questions.
6. Question **ONE** carries **30 MARKS** and the rest carry **10 MARKS** each.
7. **Write all your answers in the Examination answer booklet provided.**

QUESTION ONE

- a) Statistics is a very useful discipline in the business world, explain the meaning of statistics and illustrate any four of its applications in real life situations

(5**marks)**

- b) The following data shows the marks scored by 40 students in a CCU 103 test:

Class Interval (Marks)	Frequency (f)	Cumulative Frequency
0 - 10	2	2
10 - 20	5	7
20 - 30	8	15
30 - 40	14	29
40 - 50	7	36
50 - 60	4	40

Using the data above, obtain:

- i. The Mean
(3 Marks)
- ii. The median
(4 Marks)
- iii. Mode
(3 Marks)

- c) Alice wishes to buy a television set worth Ksh. 45,000 cash through an instalment plan. She pays a down payment of Ksh. 10,000. The balance

is paid in 24 monthly instalments. The interest charged on the original balance is 9% per annum

- i. Calculate the original balance after the down payment.
(2 Marks)
- ii. Calculate the total interest charged over the repayment period.
(3 Marks)
- iii. Calculate the instalment price (Hire Purchase Price).
(3 Marks)

- d) Find the vales of x and y for the following simultaneous equations
elimination method

$$3x + 4y = 21$$

$$5x - 2y = 9$$

(4 Marks)

- e) The data below shows the price of sugar over given years. Construct fixed base index numbers taking 2021 as the base year.
(3 Marks)

Year	2021	2022	2023	2024	2025	2026
Price(Sh s)	120	125	140	150	135	160

QUESTION TWO

- a) A manager at a small firm is tracking two employees, Alice and Bob, on whether they complete their assigned tasks on time (T) or late (L) on a given day. Using this illustration, define the following terms
- i). Sample Space
(2 marks)

ii). Mutually Exclusive events

(2 marks)

- b)** Your Human resource manager has tasked you to carry out a study to determine the level of satisfaction of employees in your organization. Describe any three methods of data collection you would employ in this task **(6 marks)**

QUESTION THREE

- a) Solve the quadratic equation below using factorization method

$$6x^2 + 11x - 10 = 0$$

(4

Marks)

- b)** What compound rate of interest will be required to produce Ksh. 10,000 after five years with an initial investment of Ksh. 8,000? **(4 Marks)**
- c) During interview, a researcher comes up with the questions to ask before meeting the respondents. Explain any 2 disadvantages of this approach as a method of data collection **(2 Marks)**

QUESTION FOUR

Peter invested Ksh. 50,000 at a compound interest rate of 10% per annum.

- a) Calculate the amount he will have after 5 years. **(3 Marks)**
- b) What rate of compound interest would be required to grow Ksh. 40,000 to Ksh. 60,000 in 6 years? (Round to 2 decimal places) **(4 Marks)**
- c) How long will it take for a sum of money to double itself at 8% per annum compound interest? **(3 Marks)**

QUESTION FIVE

In a survey on household monthly expenditure (in Ksh.), the following grouped data was collected from 50 households:

Monthly Expenditure (Ksh.)	Number of Households
5,00 - 1000	6
1000 - 1500	12
1500 - 2000	18
2000 - 2500	9
2500 - 3000	5

From the above data, calculate:

- a) Quartile 1
(3 Marks)
- b) Quartile 3
(3 Marks)
- c) Decile 6
(3 Marks)
- d) Semi-Interquartile Deviation **(1**
Mark)

QUESTION SIX

A manufacturing company independently produces two products, X and Y. The probability that product X meets quality standards is 0.75 and the probability that product Y meets quality standards is 0.60.

- i. Draw a tree diagram to represent the outcomes of the two products.

(3 Marks)

- ii. Find the probability that both products meet quality standards.

(2 Marks)

- iii. Find the probability that neither product meets quality standards.

(2 Marks)

- iv. Find the probability that at least one product meets quality standards.

(3 Marks)

Formulas

Median = $L + \frac{i}{f} (M - C)$

Formula for finding Index numbers by *Laspeyres Method* (L)

$$P_L = \frac{\sum P_1 q_0}{\sum P_0 q_0} \times 100$$

Where: P_L = Laspeyres price index number

P_0 = price of the base year

q_0 = quantity of the base year

P_1 = price of the current year

q_1 = quantity of current year

Formula for finding Index numbers by *Paasche Method (P)*

$$P_P = \frac{\sum P_1 q_1}{\sum P_0 q_1} \times 100$$

Where: P_P = price index number

P_0 = price of the base year

q_0 = quantity of the base year

P_1 = price of the current year

q_1 = quantity of current year

Formula for finding Index numbers by *Fisher's Ideal Method*

$$P_F = \sqrt{(P_L \times P_P)}$$

Quadratic Formula

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Simple interest formula

$$A = S = P (1 + r n)$$

Compound interest

$$A = S = P (1 + r)^n$$

Mean $\bar{x} = (\sum f_x) / (\sum f)$

Computation method

$$\text{Mode} = L + \left(\frac{f_1 - f_0}{2f_1 - f_0 - f_2} \right) \times c$$

The semi-interquartile range,

$$\text{SIR} = \frac{Q3 - Q1}{2}$$