

The  
Management  
University  
of Africa



Sponsored by the Kenya Institute of Management

---

DIPLOMA UNIVERSITY EXAMINATION  
SCHOOL OF MANAGEMENT AND LEADERSHIP  
DIPLOMA COMMON UNIT

DCU 103: BASIC BUSINESS STATISTICS

DATE: 25<sup>TH</sup> JULY 2022

DURATION: 2 HOURS

MAXIMUM MARKS: 70

INSTRUCTIONS

1. Write your registration number on the booklet.
2. DO NOT write in 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**

The quality controller in a given firm had an accurate record of all the iron bars produced in May 2022. The following data shows those records. Use the data to compute the follow

Bar lengths (cm)	No. of bars(f)
201 - 250	25
251 - 300	36
301 - 350	49
351 - 400	80
401 - 450	51
451 - 500	42
501 - 550	30

- i) Mean of the distribution (3 Marks)
- ii) Mode of the distribution (4 Marks)
- iii) Median of the distribution (4 Marks)
- iv) Absolute mean Deviation (4 Marks)
- v) Q1 and Q3 (6 Marks)
- vi) Semi interquartile deviation (2 Marks)
- vii) Standard deviation (5 Marks)
- viii) Variance (2 Marks)

**QUESTION TWO**

From the following data, calculate index numbers for 2021 taking 2020 as the base and using the following formulae;

- a) Laspeyres (4 Marks)
- b) Paasche (4 Marks)
- c) Fishers (2 Marks)

	2020		2021	
	Price (Shs)	Quantity (bags)	Price (Shs)	Quantity (bags)
Maize	8	80	10	110
Wheat	10	90	12	108
Beans	16	256	20	340

**QUESTION THREE**

- a) Solve the equation using matrix Algebra (4 Marks)

$$2x + 3y = 13$$

$$3x + 2y = 12$$

- b) Using the matrix below calculate

- i) Determinant (2 Marks)

- ii) Inverse (4 Marks)

$$\begin{pmatrix} 4 & 2 & 3 \\ 5 & 6 & 1 \\ 2 & 3 & 0 \end{pmatrix}$$

**QUESTION FOUR**

Describe five methods of data collection (10 Marks)

**QUESTION FIVE**

Peter has a plan to buy a motor car after 3 years. The motor car is expected to cost him Sh. 220,000. He deposits Sh. 80,000 at the beginning of the first year and Sh. 40,000 at the beginning of the second year. Calculate the amount which should be deposited at the beginning of the third year if compound interest is paid at the rate of 10% per annum in order to enable him to buy the motor car (10 Marks)

**QUESTION SIX**

- a) Determine the nature of the turning point of  $y=x^2-8x+60$  **(5 Marks)**
- b) A number of families at a particular were measured by the number of children to give the following frequency distribution:

No. of children	0	1	2	3	4	5 or more
No. of families	12	28	22	8	2	2

Use this information to calculate the probability that another family of this type will have

- (i) 2 **(1 Mark)**
- (ii) 3 or more **(2 Marks)**
- (iii) less than 2 children **(2 Marks)**

**BASIC BUSINESS STATISTICS FORMULAE****Formula method for finding the median**

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

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

$$P_{01} = \frac{\sum P_1 q_0}{\sum P_0 q_0} \times 100$$

Where:  $P_{01}$  = 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)***

$$P_{01} = \frac{\sum P_1 q_1}{\sum P_0 q_1} \times 100$$

Where:  $P_{01}$  = 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***

$$P_{01} = \frac{\sum P_1 q_0}{\sum P_0 q_0} \times \frac{\sum P_1 q_1}{\sum P_0 q_1} \times 100$$

$$P_{01} = \sqrt{(L \times P)}$$

**Formula for finding Index numbers by *Marshall-Edge Worth method***

$$P_{01} = \frac{\sum (q_0 + q_1) P_1}{\sum (q_0 + q_1) P_0} \times 100$$

On opening the brackets;

$$P_{01} = \frac{\sum P_1q_0 + P_1q_1}{\sum P_0q_0 + P_0q_1} \times 100$$

**Formula for finding standard deviation**

$$\sigma = \sqrt{\frac{\sum fx^2}{\sum f} - \left(\frac{\sum fx}{\sum f}\right)^2}$$

**Quadratic Formula**

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

**Simple interest formula**

$$A = S = P(1 + rn)$$

**Compound interest**

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

$$\text{Mean } \bar{x} = \frac{\sum fx}{\sum f}$$

**Computation method**

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

**The semi-interquartile range,**

$$\text{SIR} = \frac{Q_3 - Q_1}{2}$$