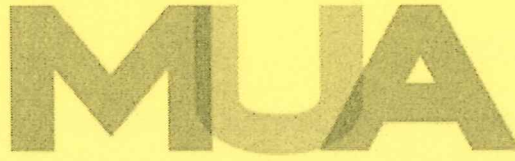


The
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DIPLOMA UNIVERSITY EXAMINATION
SCHOOL OF MANAGEMENT AND LEADERSHIP
DIPLOMA COMMON UNIT

DCU 103: BASIC BUSINESS STATISTICS

DATE: 8TH AUGUST 2023

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

- a) The probability that a contractor will get a plumbing contract is $\frac{2}{3}$ and the probability that he will not get an electric contract is $\frac{5}{9}$. If the probability of getting at least one contract is $\frac{4}{5}$, what is the probability that he will get both?
(4 Marks)
- b) Using the following data, calculate the following

Marks	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
No. of students	2	7	21	25	30	35	28	12

- (i) Q1 (3 Marks)
- (ii) Q3 (3 Marks)
- (iii) Interquartile range (2 Marks)
- (iv) D3 (3 Marks)
- (v) P40 (3 Marks)
- c) Solve the following systems of linear simultaneous equation by Cramers' rule (6 Marks)
- $$x_1 + 2x_2 + 4x_3 = 4$$
- $$2x_1 + x_3 = 3$$
- $$3x_2 + x_3 = 2$$
- d) State three limitations of index numbers (3 Marks)
- $$2x^2 + 3x + 1 = 0$$
- e) Construct the chain base index numbers from the following data. (3 Marks)

Year	2012	2013	2014	2015	2016	2017
Price (Shs)	120	125	140	150	135	160

QUESTION TWO

- a) What compound rate of interest will be required to produce Ksh. 5,000 after five years with an initial investment of Ksh. 4,000 (3 Marks)
- b) How long will it take for a given sum of money to double itself at 10% per annum compound interest. (3 Marks)
- c) Calculate the compound interest of sh. 20,000 for 3 years at 10% per annum (4 Marks)

QUESTION THREE

The data below was obtained from a survey of different companies on the monthly turnover of casual workers and the information is as represented.

Monthly turnover of workers	Frequency
40-60	5
60-80	7
80-100	7
100-120	18
120-140	23
140-160	14
160-180	10
180-220	16

Using the above data calculate the following measures:

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

QUESTION FOUR

The following table shows the quantities of four types of construction materials sold and their unit prices in the year 2017 and 2018:

Type of construction material	Year 2017		Year 2018	
	Price (Sh.)	Quantity (Units)	Price (Sh.)	Quantity (Units)
Tiles	500	100	800	120
Roofing sheets	800	140	1,000	120

Steel bars	400	150	800	110
Timber	500	100	900	100

Using 2017 as the base year calculate

- i. The laspeyer's price index (5 Marks)
- ii. The Paasche's price index (5 Marks)

QUESTION FIVE

- a) A survey of 90 people asked which supermarket they preferred. The results are shown in the table below:

Supermarket	A	B	C	D	E
Frequency	14	23	10	37	6

Draw a pie chart of the data to illustrate the results by calculating the angle of the sector for Supermarket A, Supermarket B, Supermarket C and Supermarket D and Supermarket E. (5 Marks)

- b) Find the derivative of $y = (5x + 7)(3x + 5)$ (5 Marks)

QUESTION SIX

Describe application of the statistics as a discipline (10 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;

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

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,

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