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(University of Choice)

MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY (MMUST)

UNIVERSITY EXAMINATIONS
2023/2024 ACADEMIC YEAR

FIRST YEAR SECOND SEMESTER EXAMINATIONS

FOR THE DEGREE OF

BACHELOR OF COMMERCE AND BACHELOR OF SCIENCE IN ACCOUNTING

COURSE CODE: **BCB 125**

COURSE TITLE: **BUSINESS STATISTICS**

DATE: FRIDAY 19TH APRIL 2024 **TIME: 11.00-1.30 PM**

INSTRUCTIONS TO CANDIDATES

1. The Paper Contains Two Sections: Sections I and II
2. Answer *All Questions in Section I* and *Any Two Questions in Section II*
3. Clearly show your workings for each question
4. All rough work must be done in the Answer Booklet and cancelled
5. Graphs should be clearly illustrated in the Graph Papers provided.

TIME: **2 HOURS**

MMUST observes ZERO tolerance to examination cheating

This paper consists of 5 printed pages. Please turn over ▶

SECTION I: COMPULSORY (30 MARKS)
(Answer ALL Questions from this Section)

QUESTION ONE

a) State with reasons which of the following represent discrete data and which represent continuous data:
   i) Number of cars sold over a specific period of time (01½ marks)
   ii) Speed of automobile in kilometres per hour (01½ marks)
   iii) Number of students in the university (01½ marks)
   iv) Number of millimetres of rainfall in Kakamega during various months in the year (01½ marks)

b) The following data relate to the trading of a certain Limited Company shares at the stock market:

Number of Stock	10	12	15	23	20
Price in KES Millions	14	17	23	25	21

Calculate;
   i) Regression coefficient between stock and price of shares (06 marks)
   ii) Comment on the coefficient of regression (02 marks)

c) The below information regards the daily incomes of two villages in Kakamega County:

Particulars	**Kolomatangi**	**Lurambi**
No. of people	600	500
Average daily income	175	186
Variance of the income	100	81

Calculate the combined standard deviation (06 marks)

d) A market survey conducted in four locations in Kakamega County pertaining to preference for Brand "A" soap. The responses are shown below:

Ratings	**Joyland**	**Amalemba**	**Lurambi**	**Sichirai**
Yes	45	55	60	50
No	35	45	35	45
No opinion	5	5	5	5

Required:
   i) What is the probability that a consumer selected at random preferred 'A' (02 marks)
   ii) What is the probability that a consumer preferred brand 'A' and was from Lurambi (02 marks)
   iii) What is the probability that a consumer preferred brand 'A' given that he was from Lurambi (03 marks)

iv) Given that a consumer preferred brand 'A', what is the probability that he was from Sichirai (03 marks)

SECTION II (40 MARKS)

(Answer Any Two Questions from this Section)

QUESTION TWO

The following data relates to purchases in units made by a certain company:

100	150	149	105	109	101	160	200	105	205
210	111	114	131	121	123	133	129	149	148
152	157	159	167	168	161	171	173	181	189
182	191	192	199	197	201	209	202	207	195
185	165	155	145	125	175	115	109	105	201
176	177	168	169	159	157	100	148	147	111

Required:

a) Derive a frequency distribution table from the data (04 marks)
b) Construct a frequency curve (04 marks)
c) Compute the arithmetic mean (03 marks)
d) Calculate the median (03 marks)
e) Calculate the standard deviation (03 marks)
f) Calculate Bowley's Coefficient of Skewness (03 marks)

QUESTION THREE

a) A random sample of households has been selected to determine a price index for housing utilities. The following average annual figures have been obtained:

Item/ Year	Price (in KES) Per Kilogram 2022	2023	2024	Quantities (Kilograms) Item/ Year	2022	2023	2024
Maize	2.05	2.09	2.10	Maize	64	68	70
Beans	8.25	8.60	8.80	Beans	8.7	9.0	9.5
Potato	2.45	2.90	2.50	Potato	56	55	60

Calculate the index numbers for 2024 taking 2022 as the base year using the following formulae:

i) Laspeyres (03 marks)
ii) Paasches (03 marks)
iii) Fishers (03 marks)
iv) Marshall Edgeworth's (03 marks)

b) Briefly describe the following components of time series with examples:

i) Secular Trend (02 marks)
ii) Seasonal Variations (02 marks)
iii) Cyclical Variations (02 marks)

iv) Irregular Variations (02 marks)

QUESTION FOUR

a) State with reasons which sampling method would be associated in each of the following cases with:
   i) An airline is taking a sample of its first class and tourist class passengers to access the quality of its in-flight meals. The passengers' ratings must be taken directly after they have eaten their meals (02 marks)
   ii) An Agronomist wants to take a sample to compare the effectiveness of two fertilizers on a variety of crops under a range of climate and soil conditions (02 marks)
   iii) A Lecturer asks students for suggestions as to how to improve curriculum. He plans to use their suggestions as a basis for a questionnaire concerning curriculum preferences (02 marks)
   iv) The Government wants to compare the wages of its clerical workers with the wages of persons holding comparable jobs in private sector (02 marks)
   v) Kikuru supermarket wants to determine the demand of their products among various urban centres (02 marks)

b) Two panellists conducting an interview are asked to rank a group of employees in order of potential for eventually becoming a top managers. The ranking are as follows:

Employee/ Panellist	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**
Ranking of Panellist 1	10	2	1	4	3	6	5	7	9	8
Ranking of Panellist II	9	4	2	3	1	5	6	7	10	8

Required:
   i) Compute the spearman's rank coefficient of correlation (08 marks)
   ii) Comment on the value (02 marks)

QUESTION FIVE

a) Sichewa Sugar Company a leading sugar manufacturer in Kenya produces the following amount of sugar annually in thousands of tonnes

Year	2017	2018	2019	2020	2021	2022	2023
Production in '000	80	90	92	83	94	99	92

   i) Fit a straight-line trend to these figures (04 marks)
   ii) Plot these figures on a graph and show the trend line (06 marks)
   iii) Estimate the likely sales of the company during 2024 and 2025 (04 marks)

b) Briefly describe with illustrations the following types of curves as used in Kurtosis:
   i) Leptokurtic (02 marks)
   ii) Mesokurtic (02 marks)
   iii) Platykurtic (02 marks)