



Kasarani Campus
Off Thika Road
Tel. 2042692 / 3
P. O. Box 49274, 00100
NAIROBI
Westlands Campus
Pamstech House
Woodvale Grove
Tel. 4442212
Fax: 4444175

KIRIRI WOMENS' UNIVERSITY OF SCIENCE AND TECHNOLOGY
UNIVERSITY EXAMINATION, 2022/2023 ACADEMIC YEAR
FIRST YEAR, SECOND SEMESTER EXAMINATION
FOR THE DEGREE OF BACHELOR OF BUSINESS AND INFORMATION
TECHNOLOGY

Date: 8th December, 2022
Time: 8.30am –10.30am

KMA 2115 - BUSINESS STATISTICS

INSTRUCTIONS TO CANDIDATES

ANSWER QUESTION ONE (COMPULSORY) AND ANY OTHER TWO QUESTIONS

QUESTION ONE (30 MARKS)

- a) For the data given, find the mean and variance. 3, 5, 12, 8, 7, 10, 6, 9, 7
(4 Marks)
- b) Mr. Nyaga wanted to understand the distribution of his data by computing coefficients of Skewness and Kurtosis and obtained the values 0 and 4 respectively. As a statistician comment on these two values
(3 marks)
- c) The following are the marks of 20 students in an assignment

84	17	36	42	x	52	74	52	72	20
64	64	52	54	51	44	40	20	52	72

If the mean mark is 50, compute \bar{x} and the coefficient of variation

(5 marks)

Items of expenditure	Price relatives, 1983	Average expenditure per USD 1 (Shs.)
Food	160	3.5
Housing	175	2.0
Education	125	1.5
Clothing	130	1.0
Miscellaneous	120	2.0

Calculate the 1983 cost-of living index and interpret the value obtained
(5 marks)

- f) If a random variable X has a binomial distribution with mean 5 and standard deviation 2. Find the values of n and p
(5 marks)

- g) A time series can be viewed as being made up of a number of components. Explain these components using examples. (4 marks)

QUESTION TWO (20 MARKS)

- a) Given the data below

Classes	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-65	66-70
Frequency	7	13	9	18	12	21	11	9	7	3

Find

- i) mean (using a suitable assumed mean) (3 marks)
 - ii) median (3 marks)
 - iii) mode of the observations (3 marks)
- b) State three properties of the normal distribution (3 marks)
- c) A company produces jars of English Honey. The weight of the glass jars used are normally distributed with a mean 122.3g and standard deviation of 2.6g. calculate the probability that a randomly chosen jar will weigh
- i) Less than 127g (3 marks)
 - ii) Less than 129.2g but more than 124.5g (4 marks)

QUESTION THREE (20 MARKS)

- a) In a certain estate, monthly salaries earned by the inhabitants were summarized in a table shown below

Salary ('000)	1-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100
frequency	6	5	8	10	12	17	20	12	7	3

Calculate

- i) Interquartile range (4 marks)
 - ii) Coefficient of variation (3 marks)
 - iii) Median (3 marks)
- b) A manufacturer of optical lenses has the following data on the cost per unit (in USD) of a certain custom-made lenses and the number of units made in each order
- | Number of Units (X) | 1 | 3 | 5 | 7 | 10 | 12 |
|---------------------|----|----|----|----|----|----|
| Cost per Unit (Y) | 58 | 52 | 46 | 40 | 37 | 22 |
- i) Obtain the simple linear regression model (5 marks)
 - ii) Sketch the regression line obtained in part (a) above (3 Marks)
 - iii) Predict the unit cost in an order of 8 of these glasses (2 Marks)

QUESTION FOUR (20 MARKS)

- a) In a consignment of 20 articles, just 4 are defective. If a random sample of 5 articles is taken from this consignment, find the probability that it will contain
- i) No defective article (3 marks)
- ii) 3 or more defective articles (3 marks)
- b) Explain the four components of time series (8 marks)
- c) Fit a linear trend line equation for the following data and obtain the trend values using the fitted trend line. Use $t = \text{year} - 1983$

Year	1980	1981	1982	1983	1984	1985	1986
No. of production units, X_t	125	128	133	135	140	141	143

(6 marks)

QUESTION FIVE (20 MARKS)

- a) The following data shows sales of some commodities in a certain retail shop for seven consecutive days

Commodity	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
Rice	197.7	205.7	205.3	204.5	203.5	203.8	204.0
Wheat	158.8	159.1	158.9	158.2	160.0	160.5	160.8
Sugar	269.8	269.9	270.4	256.1	256.0	256.5	256.8

Calculate mean, standard deviation and coefficient of variation for each commodity and interpret the results (10 marks)

- b) The House of Suzanne holds four annual fashion previews. Records show that the probability that a buyer will attend from zero to four of these function is as shown in the table

Number of previews attended	0	1	2	3	4
Probability	0.08	0.44	0.31	0.12	0.05

What is the probability that an individual buyer will attend at least three of the preview

(3 marks)

- c) Given the following frequency distribution, which represents purchases by 25 customers who visited a small shoe store in one day

Sales (in USD)	Number of sales
35-44	4
45-54	6
55-64	8
65-74	4
75-84	3

Compute the coefficient of skewness and use the obtained value to comment on the distribution of sales. (7 marks)