



MACHAKOS UNIVERSITY

University Examinations 2022/2023

SCHOOL OF PURE AND APPLIED SCIENCES

DEPARTMENT OF MATHEMATICS

SECOND YEAR FIRST SEMESTER EXAMINATION FOR
DIPLOMA IN INFORMATION AND COMMUNICATION TECHNOLOGY

2920/204 QM–QUANTITATIVE METHODS

DATE: 30/3/2023

TIME: 8:30 – 11:30 AM

Instructions; the paper contains five questions answer all questions

QUESTION ONE

- a) Discuss five methods of data collection (10 marks)
- b) From the following data calculate index numbers for 2019 taking 2018 as the base and using the following formulae.

Laspyre's, Paasche's, Fishers ideal and Marshall edge worth method.

	2019		2018	
	Quantity	Price	Quantity	Price
Maize	65	20	135	30
Wheat	95	8	160	7
Beans.	150	5	320	8

(10 marks)

QUESTION TWO

- a) Discuss five factors to be considered when constructing index number. (10 marks)
- b) An examination of 8 applicants for a clerical post was taken by a firm. From the marks obtained by the applicants in the accountancy and statistics papers, compute the spearman's coefficient of correlation and comment on the relation.

Applicant	A	B	C	D	E	F	G	H
Marks in accountancy	15	20	28	12	40	60	20	80
Marks in statistics	40	30	50	30	20	10	30	60

(10 marks)

QUESTION THREE

- a) The data below shows the demand for avocados in china for a period of 10 years.

Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Production in tonnes	21	22	23	25	24	23	25	26	28	27

- Using product moment rule, find out the relationship between the year and levels of production
 - Estimate the levels of production for the year 2019 (10 marks)
- b) Explain each of the following terms as applied in sampling (10 marks)
- Population
 - Statistic
 - Parameter

QUESTION FOUR

- Outline two advantages and two disadvantages of moving averages as a method of measuring secular trend in time series (4 marks)
- Differentiate between the terms correlation and regression as used in statistics (4 marks)
 - An agriculturalist used Karl Pearson's coefficient of correlation method to determine the relationship between the amount of fertilizer per unit crop yield per area of land and the unit area of land. He got a figure of 0.994, interpret this value (2 marks)
- Describe each of the following as used in statistics
 - Stratified
 - Multi-stage (4 marks)

- d) The table below shows the weight of children recorded in a certain clinic in one day. Use it to answer the questions that follow

Class interval in (Kg)	Frequency
1-10	5
10-20	10
20-30	15
30-40	8
40-50	7

Draw a cumulative frequency curve

(6 marks)

QUESTION FIVE

Table 5 shows the cost of advertising a product and the corresponding sales realized.

Use it to answer the following questions

	Jan	Feb	March	April	May
Cost of advertising ('000')	10	12	15	23	20
Sales realized ('000')	14	17	23	25	21

- Determine the regression equation of X (cost of advertising) on y (sales realized)
(10 marks)
- Using equation in (i) above calculate the expected sales for same year for the month of June, given that the company's budget to advertise in June is
ksh. 300,000 (4 marks)
- With aid of diagrams distinguish between the terms skewness and kurtosis as measures of dispersion (6 marks)