2902/204 2908/204
2909/204 2920/204
QUANTITATIVE METHODS
July 2023
Time: 3 hours

THE KENYA NATIONAL EXAMINATIONS COUNCIL

DIPLOMA IN SALES AND MARKETING
DIPLOMA IN HUMAN RESOURCE MANAGEMENT
DIPLOMA IN ROAD TRANSPORT MANAGEMENT
DIPLOMA IN INFORMATION COMMUNICATION TECHNOLOGY

MODULE II

QUANTITATIVE METHODS

3 hours

INSTRUCTIONS TO CANDIDATES

You should have a scientific calculator for this examination.
This paper consists of SEVEN questions.
Answer any FIVE questions in the answer booklet provided.
Candidates should answer the questions in English.

This paper consists of 5 printed pages.

Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.

Turn over

1. (a) Explain **five** advantages of observation as a method of data collection. (10 marks)

(b) The following is the distribution of the ages of transport vans in a company:

Age	Number of vans
0 - 2	10
2 - 4	6
4 - 6	18
6 - 8	10
8 - 10	14
10 - 12	2

Determine the:

(i) mean;
(ii) median;
(iii) mode.

(10 marks)

2. (a) Explain **five** disadvantages of the simple random sampling method of data collection.
(10 marks)

(b) The following data relates to two factories; X and Y, operating in the same industry.

Factory	Average monthly wages (ksh)	Standard deviation of wages	Number of workers
X	15,000	1,000	120
Y	13,500	1,500	100

(i) Determine the:

(I) combined mean of all the workers in the two factories.

(II) coefficient of variation of the monthly salaries for each factory.

(ii) Using the results in (II) above, comment on the variability in the monthly wages in the two factories.

(10 marks)

3. (a) The following information relates to the sales of a company for three products; A, B and C for a period of three years:

	Product sales (Ksh millions)		
Year	**A**	**B**	**C**
2019	30	40	50
2020	40	40	70
2021	40	50	90

Present the data above in a component bar-chart. (9 marks)

(b) The following are the ranks given by 3 judges in a beauty contest:

Candidate	**Judge I**	**Judge II**	**Judge III**
A	4	4	9
B	7	6	5
C	5	10	7
D	2	3	10
E	9	8	4
F	1	2	6
G	6	9	1
H	3	1	8
I	8	5	2
J	10	7	3

(i) Determine the Spearman's rank coefficient of correlation for each pair of judges.

(ii) Using the results in (i) above, determine the pair of judges that is most inconsistent in regard to beauty.

(11 marks)

4. (a) Explain **four** limitations of using questionnaires in the collection of data. (8 marks)

(b) A box contains bag A and bag B. Bag A contains 5 apples and 6 oranges, while bag B contains 5 apples and 4 oranges. A bag is selected at random and two fruits are selected at random one at a time with replacement.

(i) Present the information above in a tree diagram.

(ii) Determine the probability of selecting:

(I) **two** apples;
(II) **two** oranges;
(III) an orange and an apple.

(12 marks)

5. (a) Explain **five** uses of regression analysis in business decision making. (10 marks)

(b) The following are the quarterly sales made by a retailer for four consecutive years in thousands of shillings.

Quarterly Sales (ksh 000's)

Year	I	II	III	IV
2018	26	44	116	46
2019	32	56	122	50
2020	34	58	122	52
2021	36	60	130	58

Determine the seasonal variation indices. (10 marks)

6. (a) Outline five advantages of the arithmetic mean as a measure of central tendency. (10 marks)

(b) A newly employed graduate intends to buy a car at a cost of Ksh 1,500,000, 5 years from now.

(i) Determine the lump sum amount that he needs to deposit at the beginning of the 5 year period in an account paying compound interest at the rate of 13% per annum to achieve his objective.

(ii) Determine the compound rate of interest per annum that he should negotiate if he deposits Ksh 1,200,000 in an account at the beginning of the 5-year period to achieve his objective.

(10 marks)

7. (a) Outline **four** properties of a normal distribution curve. (8 marks)

(b) The following is the distribution of marks scored by students in an examination:

Marks	Number of students
40 - 50	10
50 - 60	15
60 - 70	35
70 - 80	25
80 - 90	10
90 - 100	5

Determine the:

(i) interquartile deviation;
(ii) quartile deviation;
(iii) coefficient of quartile deviation.

(12 marks)

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