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QUANTITATIVE METHODS

November 2018

Time: 3 hours

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THE KENYA NATIONAL EXAMINATIONS COUNCIL

**DIPLOMA IN SALES AND MARKETING
DIPLOMA IN HUMAN RESOURCES 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.**

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Turn over

1. (a) Explain five advantages of using interview as a method of data collection. (10 marks)
- (b) A company advertised for a position of a Managing Director. The number of applicants for the position were 50, out of which 10 were shortlisted for interview. Determine the probability that an applicant selected at random will be:
- shortlisted for interview;
 - shortlisted for interview and employed as the Managing Director;
 - employed as the Managing Director, given that he has been shortlisted for interview;
 - shortlisted for interview and not employed as the Managing Director;
 - not shortlisted for interview.
- (10 marks)

2. (a) Differentiate between each of the following terms as used in financial mathematics:
- perpetuity and annuity;
 - ordinary annuity and annuity due.
- (8 marks)
- (b) The following are the ranks awarded to ten employees in a company by three judges X, Y and Z according to their performance.

Employee	Judge X	Judge Y	Judge Z
A	4	8	8
B	7	5	5
C	10	9	7
D	1	2	1
E	5	4	3
F	2	3	4
G	6	7	6
H	9	10	10
I	8	6	9
J	3	1	2

- Calculate Spearman's rank correlation coefficient for each pair of judges.
 - Based on the results in (i) above, determine the pair of judges that were most consistent in their ranking.
- (12 marks)

- 3/ (a) Explain five reasons for classification of data. (10 marks)
- (b) The following information shows the distribution of salaries of employees in a company:

<u>Salary (Ksh 000's)</u>	<u>Number of employees</u>
10-20	4
20-30	24
30-40	16
40-50	12
50-60	16
60-70	6
70-80	10
80-90	8
* 90-100	4

Determine the:

- (i) mean salary;
- (ii) median salary;
- (iii) standard deviation.

(10 marks)

4. (a) Explain five reasons that make sampling to be preferred to census in the collection of data. (10 marks)
- (b) The following information shows the contribution to the national income in millions of shillings by three sectors of an economy:

<u>Year</u>	<u>MINING</u>	<u>AGRICULTURE</u>	<u>FISHING</u>
2015	150	550	300
2016	200	950	100
2017	280	700	420

Present the information in a percentage component bar chart. (10 marks)

5. (a) Explain the **four** components of a time series. (8 marks)
- (b) The following information shows the number of years of experience of ten salespersons and their respective annual sales.

<u>Years of experience</u>	<u>Annual sales (Ksh 000)</u>
8	200
6	180
4	100
10	500
7	180
4	120
6	200
7	220
14	600
8	240

- (i) Determine the regression equation of annual sales on years of experience.
- (ii) Based on the result in (i) above, estimate the annual sales of a sales person with 12 years of experience. (12 marks)

- (a) Explain **five** rules that should be followed when drawing graphs to present information. (10 marks)

- (b) The following is a distribution of profits in millions of shillings of 159 companies in the same industry.

<u>Profit (Ksh millions)</u>	<u>Number of companies</u>
0-5	10
5-10	17
10-15	28
15-20	40
20-25	35
25-30	20
30-35	9

Calculate the:

- (i) quartile deviation;
- (ii) percentile 70 (P_{70}).

(10 marks)

✓ (a) Explain the meaning of each of the following terms as used in financial mathematics:

- (i) interest;
- (ii) principal;
- (iii) discounting;
- (iv) compounding;
- (v) sinking fund.

(10 marks)

(b) The following are the sales of a company for the first ten months of the year 2017:

<u>Month</u>	<u>Sales (Ksh. million)</u>
January	20
February	18
March	22
April	35
May	27
June	28
July	38
August	33
September	31
October	41

- (i) Using three-period moving averages, determine the trend values of the sales.
- (ii) Based on the results in (i) above, comment on the trend of the sales.

(10 marks)

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