Name_____ Index No._____

2902/204
2908/204
2909/204
2920/204
QUANTITATIVE TECHNIQUES
July 2014
Time: 3 hours

Candidate's Signature_____

Date _____

THE KENYA NATIONAL EXAMINATIONS COUNCIL

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

QUANTITATIVE TECHNIQUES

3 hours

INSTRUCTIONS TO CANDIDATES

Write your name and index number in the spaces provided above.
Sign and write the date of the examination in the spaces provided above.
*This paper consists of **TWO** Sections; A and B.*
*Answer **ALL** the questions in Section A and any **FOUR** questions in Section B in the spaces provided in this question paper.*
Show all your working.
*Do **NOT** remove any pages from this booklet.*
Candidates should answer the questions in English.

For Examiner's Use Only

Section	Question	Maximum Score	Candidate's Score
A	1 - 10	32	
B		17	
		17	
		17	
		17	
	Total Score	100	

This paper consists of 20 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

SECTION A: (32 marks)

Answer ALL the questions in this Section in the spaces provided after each question.

1. State **four** areas in business where quantitative techniques may be applied. (4 marks)

2. Solve for x in the following expression. (3 marks)

$$\frac{2x-1}{5}+\frac{x}{10}=20$$

3. Outline **three** factors that should be considered before using secondary data. (3 marks)

4. State **three** factors that determine the accuracy of a sample. (3 marks)

5. Peter deposited Ksh 200,000 in a fixed deposit account that paid interest at a rate of 16% per annum, compounded semi-annually. Determine:

(i) the total amount in the account after 5 years;

(ii) interest earned on deposit. (4 marks)

6. A student scored 65, 47, 76, 52 and x marks in five subjects. Given that his average mark was 60, determine the value of x. (3 marks)

7. A certain project has the following expected outcomes, during different types of economic conditions.

	Probability	**Profits (millions)**
Boom	0.5	800
Recession	0.2	(100)
Recovery	0.3	400

Determine the expected return from the project. (3 marks)

8. Given the following sets:

$A = \{3,4,0,6,9\}$
$B = \{1,2,3,4\}$
$C = \{6,3,2,11\}$

Determine $(A \cup B) \cap C$. (3 marks)

9. State **two** methods that may be used to measure the trend in a time series. (2 marks)

10. The data below represents the prices of a commodity from the year 2000 to 2003.

Year	Price (Ksh)
2000	500
2001	520
2002	480
2003	580

Using year 2000 as the base year, calculate the fixed base index number for each year. (4 marks)

SECTION B: (68 marks)

*Answer any **FOUR** questions from this Section in the spaces provided.*

11. (a) Outline **four** advantages of Geometric Mean as a measure of central tendency. (8 marks)

(b) Using matrix approach, solve the following simultaneous equations. (9 marks)

$$2x - 3y + 4z = -4$$
$$x + 5y - 2z = 15$$
$$4x + 2y + 6z = 10$$

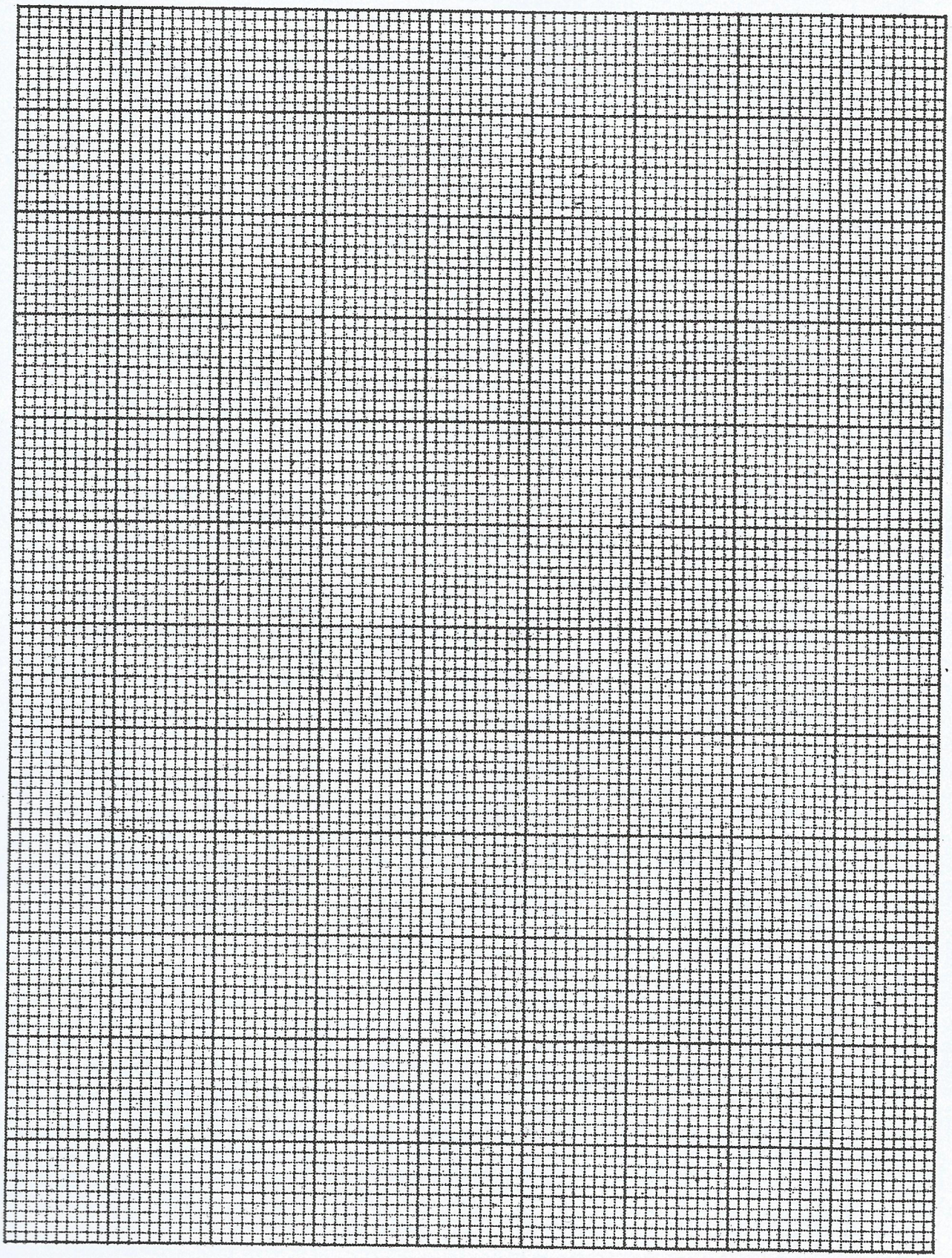
12. (a) Explain **four** advantages of the interview method in data collection. (8 marks)

(b) The table below shows the distribution of monthly rent of 300 houses in an estate.

Monthly rent (Ksh)	Number of houses
40,000 - 60,000	16
60,000 - 80,000	24
80,000 - 100,000	59
100,000 - 120,000	100
120,000 - 140,000	41
140,000 - 160,000	31
160,000 - 180,000	19
180,000 - 200,000	10

(i) Draw a histogram to present the data above;

(ii) Using the histogram in (i) above, estimate the rent paid by the majority of the tenants. (9 marks)



13. (a) Explain **four** limitations of index numbers. (8 marks)

(b) The distribution of weights (kg) of 100 students in a college was as shown in the table below:

Weight (kg)	Number of students
50.5 - 52.5	2
52.5 - 54.5	12
54.5 - 56.5	22
54.5 - 58.5	30
58.5 - 60.5	20
60.5 - 62.5	10
62.5 - 64.5	4

Calculate the co-efficient of variation. (9 marks)

14. (a) Distinguish between each of the following terms as used in probability theory:

(i) simple and compound events;

(ii) independent and dependent events. (8 marks)

(b) A firm wishes to determine the relationship between market price of its product and quantities demanded. The following data was collected over a duration of 8 weeks.

Market price (X)	45	39	30	42	20	25	32.5	41
Quantity demanded (Y)	10	16	22	13	36	27	11	14

Determine:

(i) regression equation of Y on X;

(ii) using the equation in (b) (i) above, estimate the quantity demanded in the market when the market price is Ksh 38. (9 marks)

15. (a) Outline **four** characteristics of capital investment decisions. (8 marks)

(b) A firm producing a single commodity has the following demand function, $P = 100 - 10x$ and a total cost function $TC = 5x^2 - 700x + 500$. Where x - quantity of the commodity. Determine the:

(i) profit function;

(ii) level of output that will maximise profit;

(iii) maximum profit. (9 marks)

16. (a) Outline **four** uses of time series analysis in business decision making. (8 marks)

(b) The following information relates to a project to be undertaken by a certain firm.

Activity	Preceding activities	Duration in weeks
I	-	20
II	-	24
III	I	20
IV	I	18
V	I	26
VI	I, II	34
VII	III	24
VIII	III, IV	28
IX	V	26
X	VII, VIII	24
XI	IX, VI	20
XII	X, XI	28
XIII	XII	26

(i) Draw a network to present the information above;

(ii) Determine the:

I critical path;

II expected project duration. (9 marks)