



MACHAKOS UNIVERSITY

University Examinations 2016/2017

SCHOOL OF PURE AND APPLIED SCIENCES

DEPARTMENT OF MATHEMATICS AND STATISTICS

FIRST YEAR SECOND SEMESTER EXAMINATION FOR DEGREE IN
BACHELOR OF SCIENCE IN STATISTICS AND PROGRAMMING

SST 100: INTRODUCTION TO SOCIAL AND BUSINESS STATISTICS

DATE: 30/5/2017

TIME: 8:30 – 10:30 AM

INSTRUCTION:

Answer Question ONE which is compulsory and any other TWO Questions

QUESTION ONE (30 MARKS) (COMPULSORY)

- a) Distinguish the following terms as used in social statistics
- i) Sample and Population
 - ii) Descriptive statistics and inferential statistics
 - iii) Sampling and Non-sampling errors
 - iv) Reliability and Validity (8 marks)
- b) The following are the prices of some basic items in Kenya for the year 2007 and 2017

Commodity	Unit	2007	2017
Fuel	1 Litre	50	105
Bread	Loaf	31	50
Sugar	1 kg	65	130
Milk	1 Packet	42	60

Calculate

- i) Simple index
 - ii) Simple aggregate (6 marks)
- c) Highlight four main sources of a Social data in Kenya (4 marks)
- d) Discuss the differences between additive and multiplicative time series model (4 marks)
- e) Highlight any four education status indicators in a country (4 marks)
- f) Discuss any four uses of social and business statistics in Kenya (4 marks)

QUESTION TWO (20 MARKS)

- a) Briefly discuss five advantages of stratified sampling over the other sampling methods (10 marks)
- b) The function $\hat{y} = 3.5 + 1.23x_1 + 0.78x_2$ is model of predicting the expected yield (kg '000') per hectare of a certain crop as influenced by fertilizer $k63(x_1)$ and the humidity level (x_2). Interpret the values 3.5, 1.23 and 0.78 (6 marks)
- c) Differentiate the following terms as health status indicators
- i) Anthropometry records and Vital events statistics
 - ii) Morbidity and Life expectancy (4 marks)

QUESTION THREE (20 MARKS)

- a) Discuss any five economic indicators than can be used to gauge the country's development level (10 marks)
- b) The data below shows the prices and quantities of some items for two different years

Commodity	2012		2014	
	Price	Quantity	Price	Quantity
A	2	8	4	6
B	5	10	6	5
C	4	14	5	10
D	2	19	2	13

By using the above data construct the price index numbers by using;

- i) Laspeyres' method
- ii) Paasche's method
- iii) Fisher's method and
- iv) Mashall-Edgeworth method (10 marks)

QUESTION FOUR (20 MARKS)

The data below shows the number of tourists visiting the country between the years 2003 to 2005

Year	2003				2004				2005			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4
Tourists (millions)	2.2	5.0	7.9	3.2	2.9	5.2	8.2	3.8	3.2	5.8	9.1	4.1

Calculate the time series trend by least square method and compute the residuals. (12 marks)

Discuss any four forecasting techniques employed by the government and business entities

(8 marks)

QUESTION FIVE (20 MARKS)

a) Briefly write short notes on the four components of time series. (8 marks)

b) The data relates to cactus stores sales report for years 2014 and 2015 in millions

Year	2014				2015			
Quarter	1	2	3	4	1	2	3	4
Sales (Ksh)	20	15	60	30	35	25	100	50

i. By using three order moving average calculate the trend and

ii. Determine the seasonally adjusted values by using the multiplicative model

(12 marks)