



MACHAKOS UNIVERSITY

University Examinations for 2017/2018 Academic Year

SCHOOL OF BUSINESS AND ECONOMICS

DEPARTMENT OF BUSINESS, ENTREPRENEURSHIP & MANAGEMENT

SCIENCE

**SECOND YEAR FIRST SEMESTER EXAMINATION FOR BACHELOR OF
COMMERCE**

BMS 200: BUSINESS STATISTICS

DATE: 14/12/2017

TIME: 8.30-10.30 AM

INSTRUCTIONS

Answer Question ONE And Any Other Two Questions

QUESTION ONE 30MARKS

- a) Probability distribution plays a critical role in statistical estimation .using examples of probability distribution, Explain how each can be applied in business management
(5 marks)
- b) The police chief selects a sample of 49 local police officers from a population of officers with a mean physical fitness rating of 72 with with a standard deviation of 7.0 on a 100-point physical endurance rating scale.He measures a sample mean physical rating on this scale equal to 94.Determine whether physical endurance increased at a .05 level of significance. (5 marks)
- c) The table below reports the aggregate consumption (Y,in billion of Kenya shillings)and disposable income(X,in billion of Kenya shillings)for a Kenya for the last twelve years

Year	yi	xi
1	102	114
2	106	118
3	108	126
4	110	130
5	112	136
6	124	140
7	128	148
8	130	156
9	142	160
10	148	164
11	150	170
12	164	178

Required

- i) Calculate the sample mean and standard deviation for X(the consumption)and Y (disposable income) (3 marks)
 - ii) Calculate the sample correlation between the consumption and income (3 marks)
 - iii) Calculate the sample covariance between the aggregate consumption and disposable income. (3marks)
 - iv) Calculate the intercept and coefficient for an estimated linear regression with the aggregate consumption as the independent variable and disposable income as the dependent variable. (3 marks)
- d) Explain the following terminologies as used in time series giving an example in each
- i. Secular trend (2marks)
 - ii. Seasonal variations or fluctuations (1marks)
 - iii. Cyclical fluctuations (1marks)
 - iv. Random or residual fluctuations (1marks)
- e) The average number of traffic accidents on a certain section of highway is two per week. Find the probability of exactly one accident during a one week period(Poisson probability) (3marks)

QUESTION TWO 20MARKS

- a) Differentiate between additive model and the multiplicative model as used in time series analysis. (4 marks)

- b) The following prices and quantities reflect the average weekly consumption pattern of a certain family for the years 2001 and 2002.

Item	Year 2001		Year 2002	
	Price	Quantity	Price	Quantity
	Sh.		Sh.	
Oranges (kg)	15	2	25	1
Milk (Litres)	30	2	35	2
Bread (Loafs)	30	3	40	3
Eggs (Dozens)	50	1	65	1

- i) fishers ideal price index (3 marks)
- ii) Laspeyres price index (3 marks)
- iii) Paasche price index (3 marks)
- iv) Outline four problems encountered in the construction and application of index numbers (4 marks)
- c) Differentiate between a component bar chart and multiple bar charts (4 marks)

QUESTION THREE 20MARKS

- a) A machine produces circular bolts and as a quality control test, 250 bolts were selected randomly and the diameter of their heads measured as follows:

Diameter of head (cm)			Number of components
0.9747	-	0.9749	2
0.9750	-	0.9752	6
0.9753	-	0.9755	8
0.9756	-	0.9758	15
0.9759	-	0.9761	42
0.9762	-	0.9764	68
0.9765	-	0.9767	49
0.9768	-	0.9770	25
0.9771	-	0.9773	18
0.9774	-	0.9776	12
0.9777	-	0.9779	4
0.9780	-	0.9782	1

Required

- i) The mean, mode and the median (6marks)
- ii) The standard deviation (4marks)
- iii) The coefficient of variation (3marks)
- iv) The semi interquartile range (2 marks)

- b) Briefly highlight five properties of an ideal measures of central tendency. (5 marks)

QUESTION FOUR 20 MARKS

- a) Differentiate between the following terms as used in statistics
- i) Quantitative data and Qualitative data
 - ii) Descriptive statistics and Inferential statistics
- c) The following data show monthly insurance premiums paid by a certain class of employees in an organization

Monthly insurance premium shs	Number of employees
13,000-14,000	11
14,000-15,000	24
15,000-16,000	30
16,000-17,000	10
17,000-18,000	13
18,000-19,000	8
19,000-20,000	4

Required

- i) Construct a cumulative frequency curve for the above data
 - ii) Determine from the cumulative frequency curve, the median insurance premium per month (2 marks)
 - iii) Determine the semi-interquartile range from the graph
- b) Explain the following terms as used in sampling
- i) Quota sampling
 - ii) Systemic sampling
 - iv) Quota sampling
 - v) Stratified sampling

QUESTION FIVE 20MARKS

- a) Briefly highlight four uses of time series in statistics and business management. (4 marks)

- b) The data below shows the monthly sales revenue of a coffee processing firm for the years 2010 and 2011

	Sales Revenue (Shs.Million)	
Month	2010	2011
January	7	8
February	7	8
march	8	8
April	7	9
May	9	8
June	8	8
July	8	7
August	7	8
September	6	9
October	7	6
November	8	9
December	8	9

REQUIRED

- i) A Z-chart to represent the above data (6 marks)
 - ii) Describe three components of a Z-chart that make it a preferred method of representing industrial data. (3 marks)
- b) Using practical example, Explain the hypothesis testing procedure. (6 marks)
- c) You are examining the record of an investment newsletter writer who claims a 70 percent success rate in making investment recommendations that are profitable over a one year time horizon. You have the one year record of the newsletters seven most recent recommendations .four of those recommendations were profitable .if all the recommendations are independent and the newsletter writers skill is as claimed, What is the probability of observing four or fewer profitable recommendations out of seven in total. (5 marks)