



MACHAKOS UNIVERSITY

University Examinations for 2019/2020 Academic Year

SCHOOL OF BUSINESS AND ECONOMICS

DEPARTMENT OF BUSINESS ADMINISTRATION

SECOND YEAR FIRST SEMESTER EXAMINATION FOR

BACHELOR OF COMMERCE

BMS 200: BUSINESS STATISTICS

DATE: 6/12/2019

TIME: 11.00-1.00 PM

INSTRUCTIONS:

Answer Question ONE and any other TWO Questions.

QUESTION ONE (30 MARKS)

- a) i) Differentiate between
- I. Regression analysis and Correlation analysis as used in statistics (2 marks)
 - II. Experiment and Trial as used in probability (2 marks)
- ii. MUC sells products to several Machakos customers. They are very sensitive to exchange rates. The following tables shows recent annual sales (in millions of shillings) and the average exchange rate for the year(expressed as the units of Kenyan currency needed to buy one dollar)

X_i	100	85	90	75	76	78
Y_i	20	25	16	30	35	30

Required.

Compute

- i. The sample mean and standard deviation for X and Y (4 marks)
 - ii. The sample covariance between the exchange rates and sales (3 marks)
 - iii. The correlation between exchange rates and sales (3 marks)
 - iv. The intercept and coefficient for an estimated linear regression with exchange rate as the independent variable and sales as the dependent variable (3 marks)
- Hence comment on the results (1 mark)

- b) The following data show monthly insurance premiums paid by a certain class of employees in an organization

Monthly insurance premium sh.	Number of employees
13,000-14000	11
14,000-15000	24
15,000-16000	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 frequency curve for the above data (4 marks)
- ii. From part one above, determine the modal monthly insurance premiums (2 marks)
- c) Using practical examples, explain the difference between type I and type II errors (2 marks)
- d) The weekly incomes of a large group of middle managers are normally distributed with a mean of sh.1000 and a standard deviation of shs.100
 - i. What is the probability that income is less than 790? (2 marks)
 - ii. What is the area under the normal curve between 840 and 1200? (2 marks)

QUESTION TWO 20MARKS

- a) Discuss three Axioms of probability (6 marks)
- b) Outline TWO problems encountered in the construction and application of index numbers (4 marks)
- c) The table below shows the quantities of four types of cereals consumed by certain household in the years 2007 and 2008 and the unit price for each type of cereals

Type of cereals	2018		2019	
	Price per kg.sh	Quantity kg	Price per kg.sh	Quantity kg
Maize	50	100	80	120
Rice	80	140	100	120
Beans	40	150	80	110
Peas	50	100	90	100

Required

Using year 2018 as the base year, calculate

- Laspeyres price index (5 marks)
- d) UON reported that the population means score on the quantitative portion of the graduate record examination (GRE) General test for students taking the exam was 558 with a standard deviation of 139, suppose we select a sample of 100 participants and found that the

mean score is 585 .using a 5%level of significance, is there a difference between sample mean and the population mean (5 marks)

QUESTION THREE (20 MARKS)

- a) Distinguish between probability sampling and non-probability sampling (2 marks)
- b) Hence give two types of each of the types of sampling mentioned in (a) above (6 marks)
- c) A company has three production sections A, B, C which contribute 40%,35%, and 25% respectively, to a total output. The following percentages of faulty units have been observed

A	2%	0.02
B	3%	0.03
C	4%	0.04

There is a final check before output is dispatched. calculate the probability that a unit found faulty at this check has come from section A (5 marks)

- d) A college collected the following set of bivariate data on the number of Credit grade and the number of hours of study taken during the week. A random sample of 6 students was taken and the data relating the hours of study and the number of credits is as shown in the table.

Student	A	B	C	D	E	F
Hours	20	50	30	50	25	23
Credits	13	16	12	16	15	16

Determine the Spearman’s rank correlation co-efficient between the number of hours and credits: (7 marks)

QUESTION FOUR (20 MARKS)

- a) The data given below shows the number of hours worked in one week by employees in a certain company:

46.3 39.2 44.2 41.3 45.1 42.3 43.5 40.0
 45.6 40.6 42.0 42.6 45.6 39.5 43.1 39.7
 46.1 38.9 42.4 42.1 45.0 44.4 42.4 40.8

- a) Tabulate a frequency distribution table with class interval of 1.5 starting at 38.9 – 40.4, etc. (6 marks)

- b) Using the table in (a) above, estimate by calculation each of the following statistical measures:
- i. Median; (2 marks)
 - ii. Mode; (3 marks)
 - iii. Geometric Mean; (3 marks)
 - iv. standard deviation (3 marks)
 - v. Quartile deviation. (3 marks)

QUESTION FIVE (20MARKS)

- a) Explain the **four** measurement scales for statistical data giving two examples in each case. (8 marks)
- b) Discuss the distinctive features of binomial, poisson and normal distribution. At what point is the normal distribution used to approximate the binomial distribution (8 marks)
- c) Distinguish between descriptive and inferential statistics giving appropriate examples (4 marks)