



TECHNICAL UNIVERSITY OF MOMBASA

SCHOOL OF BUSINESS

DEPARTMENT OF MANAGEMENT SCIENCE

UNIVERSITY EXAMINATION FOR:

BACHELOR OF COMMERCE, BACHELOR OF BUSINESS

ADMINISTRATION

BMS 4201: BUSINESS STATISTICS

END OF SEMESTER EXAMINATION

SERIES: AUGUST 2019

TIME: 2 HOURS

DATE: Aug 2019

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID

This paper consists of **FIVE** questions. Attempt question ONE (Compulsory) and any other TWO questions.

Do not write on the question paper.

Question ONE

- a) The frequency distribution below shows the mass of some flowers produced in a farm off Limuru road in the month of October 2018.

Mass (Kg)	Frequency (f)
20-30	7
30-40	14
40-50	22
50-60	13
60-70	6
70-80	11

Required

- i. The Arithmetic Mean (4 Marks)
- ii. The Median (3 Marks)
- iii. The Mode (3 Marks)
- iv. The Variance (3 Marks)
- v. The Standard deviation (3 Marks)
- vi. The coefficient of variation. (2 Marks)
- vii. The first Quartile (2 Marks)

b) Umoja traders collected the following data on annual sales and the years of experience of members of its sales staff.

Sales	200	191	135	236	305	183	50	192	184	73
Years	10	4	5	9	12	6	2	7	6	2

- a) Construct a scatter plot representing these data. (4 marks)
- b) Describe the kind of relationship that exists (if any) between years of experience and sales. (3 marks)
- c) Approximate the increase in sales that accrues with each additional year of experience for a member of the sales force. (3 marks)

Question TWO

a) The following data set refers to the number of customers per day at a jewellery kiosk in Christiana Mall during a 20 day period.

8 10 18 58 58 59 63 64 69 71 75 78 80
82 84 84 86 87 87 88

Required

- i) Determine the first, second, and third quartiles. (6 marks)
- ii) Determine the interquartile range (2 marks)
- iii) Construct a box and whisker plot for the data. (4 marks)
- b) i) Describe the difference between a statistic and a parameter. (4 marks)
- ii) Describe how systematic random sampling could be used to select a sample of 1000 customers who have a current account at a commercial bank. Assume that the bank has 25,000 customers who own a current account. (4 marks)

Question THREE

The following table shows the ice creams bought from a street vendor over the course of eight days (Demand). Also shown is the temperature for each day in degrees Celsius.

Temperature X	Demand Y
20	48
11	30
23	36
18	40
7	18
12	23
18	42
21	33

Required:

- (i) Calculate the product moment correlation coefficient for the data (6 Marks)
- (ii) Comment on the relationship between X and Y (2 Marks)
- (iii) Calculate the coefficient of determination for the data and interpret your answer. (2 marks)
- (iv) Use the method of linear least squares to find the estimated linear regression equation. (6 Marks)
- (v) What is the meaning of the slope of this regression line? (2 Marks)
- (vi) Predict the demand for ice creams on a day with a temperature of 15 degrees Celsius. (2 marks)

Question FOUR

- a) The results of a census of 2500 employees of a mid-sized company with NSSF retirement accounts are as follows.

Account Balance	Male	Female
Below 25000	635	495
25000 -49999	185	210
50000 - 99900	515	260
100000 and above	155	45

Suppose researchers are going to sample employees from the company for further studies.

- i) What is the probability that a randomly selected employee will be a female?
- ii) What is the probability that a randomly selected employee will be a male?
- iii) What is the probability that a randomly selected employee will have an account balance of between 25000 and 49999?
- iv) What is the probability that a randomly selected employee will be a female with an account balance between 50000 and 99900?
- v) Assume that an employee is chosen and you are told that the employee is a female. What is the probability that the selected employee will have an account balance of between 25000 and 99900?

(10 marks)

b) Explain the difference between stratified random sampling and cluster sampling. (5marks)

c) Researchers waited outside a bar they had randomly selected from a list of establishments. They stopped every 10th person who came out of the bar and asked whether he or she thought drinking and driving was a serious problem.

Required: Identify the following items from the statistical study.

- i) The population
- ii) The population parameter of interest
- iii) The sampling frame
- iv) The sample
- v) The sampling method.

(5 marks)

Question FIVE

a) The following data relate to a set of products sold in Uchumi supermarket for the years 2017 and 2018

Product	2017		2018	
	Quantity(Units)	Price(Sh)	Quantity(Units)	Price(Sh)
A	100	30	90	50
B	30	50	25	70
C	20	60	30	80
D	750	20	200	25

Required:

- i) Laspeyre's price index (4 Marks)
- ii) Paasche's price index (4 Marks)
- iii) Fisher's ideal price index (4 Marks)

b) Explain any four problems encountered when constructing index numbers. (8 marks)