



MACHAKOS UNIVERSITY

University Examinations for 2018/2019 Academic Year

SCHOOL OF BUSINESS AND ECONOMICS

DEPARTMENT OF BUSINESS ADMINISTRATION

SECOND YEAR SPECIAL/SUPPLEMENTARY EXAMINATION FOR

BACHELOR OF COMMERCE

BMS 200: BUSINESS STATISTICS II

DATE: 22/7/2019

TIME: 8:30 – 10:30 AM

INSTRUCTIONS

Answer Question one and Any Other Two Questions

1. a) State and explain five uses of statistics in business management. (5 marks)
- b) Distinguish between discrete and continuous distribution. (2 marks)
- c) Discuss any two primary data collection methods. (4 marks)
- d) How different is:
 - (i) Probability distribution of a discrete variable from probability distribution of a continuous random variable (2 marks)
 - (ii) Distinguish between null and alternative hypothesis (2 marks)
- e) Distinguish between the following terminologies
 - i. Regression analysis and correlation analysis (2 marks)
 - ii. Coefficient of correlation and coefficient of determination (2 marks)
- f) Consider the following time series data

YEAR	QUARTER			
	I	II	III	IV
1	40	20	30	50
2	60	30	50	70
3	70	60	60	80

- i) Compute the four quarter and centered moving average values for this series .
- ii) Compute the seasonal indexes for the four the quarters(use the additive model)

(11 marks)

2. a) A linear regression analysis has produced the following equation relating profits to hours of managerial time spent developing the past year's project of a firm $\text{Profit} = -957 + 85x$ where x is number of hours

- i) According to this estimated relationship, how large would the profits or(losses) be if no" time were spent in planning. (2 marks)
- ii) On the average, an extra 10 hours spent in panning would result in how large an increase in profits. (2 marks)
- iii) If the correlation coefficient $r=0.350$, what percentage of the variation in profits is explained by the time spent. (2 marks)
- iv) How much of the variation in profit is left unexplained by the number of hours spent. (2 marks)
- v) Write a paragraph explaining how much faith you should have in this prediction equation.- (2 marks)

b) State any four assumptions of linear regression analysis (2 marks)

c) Reliable furniture is a family business that has been selling to retail customers in Nairobi for many years. They advertise extensively on Radio and TV, emphasizing their low prices and easy credit terms. The owner would like to review the relationship between sales and the amount spent on advertising. Below is information on sales and advertising expenses for the last four months

Month	Advertising expenditure (Sh. Millions)	Sales revenue (sh. Millions)
July	2	7
August	1	3
September	3	8
October	4	10

- i) Draw a scatter diagram and interpret it (2 marks)
- ii) Using the LSM, determine the equation (2 marks)
- iii) Determine the correlation coefficient. What does it show (2 marks)

iv) Determine the coefficient of determination and interpret (2 marks)

3. a) Explain the following terminologies a used in time seriesanalysis giving an example in each

i) Secular trend (2 marks)

ii) Seasonal variations or fluctuations (2 marks)

iii) Cyclical fluctuations (2 marks)

iv) Random/residual fluctuations (2 marks)

b) Table below shows the cost of transportation incurred by two companies for themonth of April

Cost of transportation Sh."000"	Number of companies
100-120	17
120- 140	53
140- 160	199
160- 180	264
180-200	200
200 - 220	157
200 - 240	110

Required

i) Mean cost of advertising (5 marks)

ii) Standard deviation (3 marks)

iii) The coefficient of skewness. Comment on your result. (4 marks)

4. a) State properties of a normal probability distribution. (2 marks)
- b) A company produces light bulbs whose life follows a normal distribution with a mean of 1200 hours and a standard deviation of 250 hours. If we select a light bulb at random, what is the probability that its lifetime will be:
- i) Less than 900 hours
 - ii) Greater than 1300 hours
 - iii) Between 900 and 1300 hours (9 marks)
- c) What criteria must a binomial probability distribution meet (1 mark)
- d) From past records, the probability that a machine will need correcting adjustments during 9 days production run is 0.2. If there are 6 of these machines running on a particular day, find the probability that:
- i. No machine needs correcting (2 marks)
 - ii. Just one machine needs correcting (2 marks)
 - iii. Exactly two machines need correcting (2 marks)
 - iv. More than two machines need correcting (2 marks)
5. a) State four characteristics of a good measure of central tendency. (2 marks)
- b) The following distribution gives the patterns of overtime hours worked by 100 employees of a manufacturing company in the month of October 2005

Overtime hours worked	Number of employees
0-10	2
11-20	1
21-30	4
31-40	10
41-50	8
51-60	6
61-70	30
71-80	25
81-90	9
91 and above	5

Required:

- i) Median overtime hours (3 marks)
- ii) Modal overtime hours (3 marks)
- a) What are the limitations of using index numbers. (4 marks)
- b) Janet Chebet bakes and sells different types of cakes in the city centre. The table below shows the sales made in the year 2006 and 2007 and the unit price for each of the cake.

Type of	2006		2005	
	Unit price	quantity	Unit price	quantity
O	100	100	120	240
p	140	120	160	260
Q	180	80	140	220
R	160	140	180	250

Required: using 2006 as the base year, calculate;-

- (i) Laspyres quantity index (3 marks)
- (ii) Paashes quantity index (3 marks)
- (iii) Fishers quantity index (2 marks)