



MACHAKOS UNIVERSITY

University Examinations for 2022/2023 Academic Year

SCHOOL OF BUSINESS, ECONOMICS AND HOSPITALITY AND TOURISM

MANAGEMENT

FIRST YEAR FIRST SEMESTER EXAMINATION FOR

BACHELOR OF COMMERCE

BMS 200: BUSINESS STATISTICS

DATE:

TIME:

INSTRUCTIONS:

1. ANSWER question ONE and any OTHER TWO questions
2. Question one carries 30 marks, while the rest carry 20 marks each
3. Time: 3 hours

QUESTION ONE (COMPULSORY) (30 MARKS)

- a) Differentiate between the following terms as used in statistics.
- i. Descriptive statistics and Inferential statistics (2 marks)
 - ii. Skewness and Kurtosis (2 marks)
 - iii) Type I error and type II error (2 marks)
 - iv) Null hypothesis and alternative hypothesis (2 marks)
- (b) The following marks are the marks for 300 students in a Bms 200 class year 2014.

Marks	Number of students
0-10	1
10-20	9
20-30	25

30-40	30
40-50	80
50-60	102
60-70	40
70-80	10
80-90	2
90-100	1

Required

- Find the mean of the students marks (2 marks)
- Find the mode of the class (2 marks)
- Determine the median (2 marks)
- Find the standard deviation (2 marks)
- Compute the coefficient of skewness (2 marks)

For each measure calculated state one advantage and one disadvantage

- d) The table below shows the distribution of marks scored by 30 students in a statistics examination.

Marks	20-30	30-40	40-50	50-60	60-70
No. of students	3	6	X	7	Y

Given the modal score is 46 marks compute the value of X and Y (3 marks)

- e) Given that $n=144$, variance $=25$ and sample mean $=1500$, Construct confidence intervals for 90% and 99% levels of significance. (2 marks)
- f) A manufacturer of a certain pesticide claims that the mean amount is very packet of the pesticide is 100 milligrams. Independent research was conducted by selecting 64 packets randomly and the mean was found to be 105 milligrams with a standard deviation of 20 milligrams. Test if the manufacturers claim is justified at 0.05 level of significance.

(2 marks)

- g) The table below shows the scores awarded to two candidates by a panel of ten people

Candidate A	8	5	8	9	4	8	7	5	6	5
Candidate B	6	6	7	7	5	7	8	4	7	6

Compute the Spearman's rank correlation coefficient for the data (5 marks)

QUESTION TWO (20 MARKS)

- a) Using relevant examples, Describe the four levels of measurements used in statistics. (4 marks)
- b) During a certain military recruitment interview, 10,000 people were interviewed and their height was found to be normally distributed with a mean of 5.8 feet and a standard deviation of 0.2 feet. Find the number of recruitment with a height.
- i) Between 5.5 feet and 5.8 feet (2 marks)
- ii) Below 5.5 feet (2 marks)
- c) The following data gives data on age of employees and their performance appraisal scores in percentage of 10 workers selected random.

Employee Age	25	30	28	40	45	38	60	64	50	35
Performance appraisal	68	70	62	75	58	80	52	45	65	88

- i. Determine the regression equation of Age and performance. (4 marks)
- ii. Estimate the performance of an employee who is 48 years old (4 marks)
- iii. Compute the coefficient of correlation and coefficient of determination and interpret their values. (4 marks)

QUESTION THREE (20 MARKS)

- a) Time series has been of great importance to individuals and organizations. Explain with relevant examples. (5 marks)
- b) i) Discuss five factors that should be put into consideration while constructing index numbers (5 marks)
- c) You are provided with the following information regarding the Kenyan economy for the year 2014, 2015, and 2016.

Commodity	Maize (Kg)	Rice (Kg)	Cooking oil (litre)	Onions (Kg)
2014	50	85	150	90
2015	52	80	160	75
2016	51	82	170	85

Required:

From the above information, compute Paasches', Laspeyeres' and Fishers' Price and Quantity indices using 2014 as the base year . (10 marks)

QUESTION FOUR (20 MARKS)

- a) In a certain B. COM class, statistics show that 40% of the students do not attend classes regularly. Find the probability that in a randomly selected sample of 10 students.
- i. At most eight do not attend the classes regularly. (3 marks)
- ii. More than seven do not attend the classes regularly (3 marks)
- b) The statistics further show that the university has 2000 B. COM students. Determine
- i. The mean of students who do not attend classes regularly (2 marks)
- ii. The standard deviation of students who do not attend the classes regularly. (2 marks)
- c) A company dealing with beauty products plans to invest heavily in the marketing programme for that particular product. The initial performance of the programme is given in the table below.

Amount invested in millions	5	10	15	20	30	25
Volume of sales of the beauty products in tons	190	240	250	300	310	350

Required:

- i) By identifying, the dependent and the independent variable estimate the regression line for the data. (7 marks)
- ii) Interpret the coefficients in part (i) above (2 marks)
- iii) Estimate the volume of sales if the board of directors decided to invest 50 million in the marketing programme. (1 mark)

QUESTION FIVE (20 MARKS)

- a) A company found out that it was facing stiff competition from its competitors launching a five year plan extensive advertising campaign. The advertising costs incurred and the corresponding sales in each cash year were recorded as shown below.

Advertising cost(sh. million)	5	8	10	12	15
Sales volume in tons	8	10	13	17	20

Compute and interpret

- i. Karl Pearson's correlation coefficient (5 marks)
 - ii. Coefficient of determination (2marks)
- b) Given below are the data on a sample of 30 annual incomes (in sh. 000)

19.1	19.8	18.0	19.2	19.5	17.3
20.0	20.3	19.6	18.5	18.1	19.7
18.4	17.6	21.2	19.7	22.2	19.1
21.1	19.3	20.8	21.2	21.0	18.7
19.9	18.7	22.1	17.2	18.4	21.4

Construct a stem and leaf display for these data.

(5 marks)

c) The profit in millions of 60 firms operating in Nairobi for the year ended 31st December 2016 was as follows:

41	17	83	63	54	92	60	58	70	06	67	82
33	44	57	49	34	73	54	63	36	52	32	75
60	33	09	72	28	30	42	93	43	80	03	32
57	67	24	64	63	11	35	82	10	23	00	41
60	32	72	52	92	88	62	55	60	33	40	47

- i) Prepare a complete grouped frequency distribution table which should have the following columns (class, tally column, frequency, mid points, cumulative frequency). Strictly use inclusive method of classification (5 marks)
- ii) State three characteristics for a good measure of average (3 marks)