



# MACHAKOS UNIVERSITY

University Examinations for 2020/2021 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: 11/8/2021

TIME: 11.00-1.00 PM

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## INSTRUCTIONS:

Answer question one and any other two questions.

### QUESTION ONE (30 MARKS)

The profit in millions of 60 firms operating in Nairobi for the year ended 31<sup>st</sup> December 2020 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

#### Required

- a) Prepare a complete grouped frequency distribution table which should have the following columns (class, tally column, frequency, mid points, cumulative frequency). Strictly use exclusive method of classification (5 marks)
- b) Use the data in (a) above to plot a histogram and a cumulative frequency curve (4 marks)
- c) Using data in (a), and by applying the appropriate formulae, work out the following measures of central tendency:
  - i. Modal profit (2 marks)
  - ii. Median profit (2 marks)
  - iii. Mean profit (2 marks)

- d) Use your graph in (b) above and the measure of central tendency obtained in (c) to describe the shape of the distribution of the scores and comment on the overall financial performance of the firms (4 marks)
- e) Using relevant examples, distinguish between simple, partial and multiple correlations (3 marks)
- f) i. Calculate Spearman's coefficient of correlation between marks assigned to ten students by Judges x and y in a certain competitive test as shown below: (4 marks)

Marks by judge x	Marks by judge y
52	65
53	68
42	43
60	38
45	77
41	48
37	35
38	30
25	25
27	50

- ii. Hence from the answer obtained in (fii) above calculate the coefficient of determination and the probable error and interpret the results. (4 marks)

### QUESTION TWO (20 MARKS)

- a) You are given the following data relating to the scores obtained by 9 salesmen of a company in an intelligent test and their weekly sales in thousands of shillings.

Salesmen	1	2	3	4	5	6	7	8	9
Intelligence Test Score: ( X)	50	60	50	60	80	50	80	40	70
Weekly Sales( Y)	30	60	40	50	60	30	70	50	60

#### Required

- i. Construct a scatter diagram for the data and comment on the relationship Between salesmen intelligence test score and his weekly sales (4 marks)
- ii Determine the regression equation of the form  $y = a + bx$  of weekly sales against intelligence score (4 marks)

b) Compute the Karl Pearson product-moment correlation co-efficient and interpret the results. (4 marks)

c) Compute the standard deviation and the variance from the data below on the weight and number of apples produced in a farm A and interpret the results (5 marks)

Weight in gms	No. of Apples
410-419	14
420-429	20
430-439	42
440-449	54
450-459	45
460-469	18
470-479	7

d) The measure of probable error can be properly used when a number of conditions are met. State any of the three conditions (3 marks)

### QUESTION THREE (20 MARKS)

a) Define the term skewness and kurtosis. With the aid of a diagram, describe the three types of kurtosis. (6 marks)

b) Describe the components of a time series and mention their applicability. (6 marks)

c) The table below relates to the sales of refrigerators by a certain firm in Kenya.

Year	production in (000)	Year	Production in (000)
1996	17	2002	35
1997	20	2003	55
1998	19	2004	50
1999	26	2005	74
2000	24	2006	69
2001	40		

#### Required:

Fit a straight-line trend by the method of semi averages and estimate the number of refrigerators that will be sold in the year 2009. (8 marks)

**QUESTION FOUR (20 MARKS)**

- a) Discuss four uses of index numbers (8 marks)
- b) The data below shows the value and prices of four quantities and prices of 4 commodities produced in Central Kenya in the year 2010 and 2011.

Commodity	2010		2011	
	Price	Value	Price	Value
A	10	30	12	48
B	15	60	15	75
C	5	50	8	96
D	2	10	3	15

**Required:**

Compute the following indices and interpret them:

- i. Laspyres price index (3 marks)
- ii. Paasche's price index (3 marks)
- iii. Marshal-edgeworth price index (3 marks)
- iv. Fishers ideal price index (3 marks)

**QUESTION FIVE (20 MARKS)**

- a) Discuss four characteristics of a good measure of central tendency (8 marks)
- b) The table below shows the cost of transportation incurred by two companies for the month 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**

- a) Mean cost of advertising (5 marks)
- b) Standard deviation (3 marks)
- c) The coefficient of skewness. Comment on your result. (4 marks)