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KIRIRI WOMENS' UNIVERSITY OF SCIENCE AND TECHNOLOGY

UNIVERSITY EXAMINATION, 2024/2025ACADEMIC YEAR

SECOND YEAR, FIRST SEMESTER EXAMINATION

FOR THE DEGREE OF BACHELOR OF SCIENCE

(BUSINESS ADMINISTRATION)

Date: 5th December, 2024

Time: 11.30am – 1.30pm

KBA 2203 - STATISTICS FOR MANAGEMENT

INSTRUCTIONS TO CANDIDATES

ANSWER **QUESTION ONE (COMPULSORY)** AND **ANY OTHER TWO** QUESTIONS

QUESTION ONE (30 MARKS)

a) The number of slow-moving products sold by 20 different enterprises located at town ABC in given week are summarized in the following table

Quantity Sold	6 -10	11-15	16 - 20	21-25	26 -30
No. of Enterprises	3	5	7	3	2

Estimate;

i) Mode. (2 marks)

ii) Median. (3 marks)

iii) Mean. (2 marks)

iv) Standard deviation. (3 marks)

b) Determine and interpret the Spearman's rank correlation coefficient for the data in the table below.

Price (X)	38	16	20	37	52	54
Supply (Y)	109	75	89	85	97	91

(5 marks)

c) Find the fixed base index numbers from the following data regarding the price of an item using 2018 as the base year.

YEAR	2018	2019	2020	2021	2022	2023
PRICE	50	55	58	65	70	80

(3 marks)

d) Three balls are drawn randomly, one at a time and without replacement, from a box containing 5 white and 7 black identical balls. What is the probability that all balls picked are the same in colour? (3 marks)

e) An electric cable firm has placed an order that require a consignment of wires which have a mean diameter of 10.5 mm with a standard deviation of 1.7 mm. The company which produces the wires delivered 90 wires, which had a mean length of 9.2 mm. The construction company rejected the consignment on the grounds that they were different from the order placed. Conduct a statistical test to indicate whether you support or not support the action taken by the construction company at 5% level of significance.

(5 marks)

f) Elaborate on the four components of time series. Give appropriate examples.

(4 marks)

QUESTION TWO (20 MARKS)

a) The table below shows the prices and quantities demanded for five products A, B, C, D and E for 2022 and 2023

Commodity	2022		2023	
	Price (KES)	Quantity	Price (KES)	Quantity
A	35	38	70	47
B	95	42	110	45
C	75	52	90	65
D	35	62	30	85
E	55	47	60	63

Taking 2023 as the base year, compute the price index numbers using the following methods.

i) Laspeyre's Method. (3 marks)

ii) Paasche's Method. (3 marks)

iii) Fisher's Method. (3 marks)

iv) Marshall-Edgeworth method. (2 marks)

b) The quarterly profits record for particular enterprise is as shown in the table below.

Year	Profits (Hundred Thousand)			
	Quarter I	Quarter II	Quarter III	Quarter IV
2020	30	42	72	39
2021	31	52	85	41
2022	33	49	87	58
2023	36	55	90	65

i) Determine moving averages of extend 3. (4 marks)

ii) Obtain the seasonal indices by method of moving averages. (5 marks)

QUESTION THREE (20 MARKS)

a) Suppose 40% of the population approves of the job the governor is doing, and that 20 individuals are drawn at random from the population. What is the probability that;
   i) exactly 7 people will support the governor? (2 marks)
   ii) fewer than 5 people will support the governor? (3 marks)

b) The number of tasks send to a company printer in busy time is known to be Poisson distributed with parameter $\lambda = 2$ per minute. Compute the probability that;
   i) At least 2 tasks are sent in a minute. (3 marks)
   ii) Not more than three tasks are sent in three minutes. (3 marks)

c) The length of time an employee stay in the company is estimated to be normally distributed with mean of 10 years and a standard deviation of 4 years.
   i) Of 100 new employees, how many would you expect to stay in the company for;
      - Less than 6 years? (3 marks)
      - Between 7 and 12 years? (3 marks)
   ii) If 60% of employees stay for more than A years, find the value of A. (3 marks)

QUESTION FOUR (20 MARKS)

a) The following are the records on the number of items sold per hour in a certain general shop during the peak hours.

99	107	88	123	131	124	109	126	115	119	104	106	119
97	119	111	98	131	118	87	93	128	132	93	114	117
127	129	135	90	135	109	130	110	121	107	111	119	111
118	128	115	135	102	106	131	124	133	140	137		

Construct a grouped frequency distribution table. (3 marks)

b) From the frequency distribution table obtained above, estimate;
   i) Mode. (2 marks)
   ii) Median. (3 marks)
   iii) Inter Quartile Range. (3 marks)
   iv) Mean. (2 marks)
   v) Mean deviation. (3 marks)
   vi) Variance. (3 marks)

QUESTION FIVE(20 MARKS)

The proceeding table show the data on price and supply of a product.

Price (KES)	10	20	8	30	35	20	5	15	10
Supply (units)	88	110	105	120	110	98	80	100	95

a) Fit a linear regression equation for sales on advertisement expenditure.
(7 marks)

a) Estimate the supply when the price is KES 25.
(2 marks)

b) Determine the Pearson's correlation coefficient.
(4 marks)

c) Compute the coefficient of determination and comment on adequacy of the model.
(2 marks)

d) Obtain the Analysis of Variance (ANOVA) table.
(5 marks)