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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: 16th April, 2024
Time: 2.30pm –4.30pm

KBA 203 - STATISTICS FOR MANAGEMENT

INSTRUCTIONS TO CANDIDATES

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

QUESTION ONE (30 MARKS)

a) The profits (ksh "000") of 50 companies are given below:

20 12 15 27 28 40 42 35 37 43 55 65 53 62 29 64 69 36 25 18
56 55 43 35 26 21 48 43 50 67 14 23 34 59 68 22. 41 42 43 52
60 26 26 37 49 53 40 20 18 17

i) Classify the above data taking first class as 10-19, 21-30,.. and form a frequency distribution. (3 marks)

ii) Use the frequency table constructed in (i) above to construct an histogram (3 marks)

b) Calculate the correlation coefficient between x and y for the following data:

x	5	9	13	17	21
y	12	20	25	33	35

(5 marks)

c) Calculate regression coefficient byx of the data.
$\sum x=55, \sum y=88, \sum x^2=385, \sum y^2=385, \sum xy=586, n=10$
(4 marks)

d) Calculate Mean and Standard Deviation of income of 8 employees of a firm:
Income (Ksh"000"): 100 120 140 120 180 140 120 150 (4 marks)

e) Find the index numbers for the following data taking 1980 as the base year using Chain base method

Years	1974	1975	1976	1977	1978	1979
Price	18	21	25	23	28	30

(3 marks)

f) For two events A and B, P(A)=0.73, P(B)=0.48, and P(A∩B)=0.29.

i) Find P(A|B). (2 marks)

ii) Find P(B|A). (2 marks)

g) The mean lifetime of a sample of 400 light light tubes produced by a company is found to be 1,570 hours with a standard deviation of 150 hours. Test the hypothesis that the mean life time of the tubes produced by the company is 1,600 hours at α=0.01 significance level.

(4 marks)

QUESTION TWO (20 MARKS)

a) The sales of Jansen Foods, a small grocery chain located in Mwihoko trading centre, for 2016 through 2023 are

YEAR	2016	2017	2018	2019	2020	2021	2022	2023
VALUE	80	90	92	83	94	99	92	104

i) Fit a straight line trend equation by the method of least squares and estimate the trend

(6 marks)

ii) What is the sales forecast for 2018?

(2 marks)

b) Let X denote the time taken to deliver the goods. Then X has a normal distribution with Mean $\mu = 16$ days and standard deviation $\sigma = 2.5$ days. Calculate the following probabilities

i) The probability of a delivery being late is $P(X > 20)$

(3 marks)

ii) The probability that customers receive their orders between 10 and 15 days [i.e. $P(10 < X < 15)$] (3 marks)

c) Calculate the mode and median from the following frequency distribution

marks	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45
No. of students	5	6	15	10	5	4	2	2

(6 marks)

QUESTION THREE (20MARKS)

a) The scores for nine students in economics and accounting are as follows:

Economics(X)	35	23	47	17	10	43	9	6	28
Accounting(Y):	30	33	45	23	8	49	12	4	31

Compute the Spearman rank correlation. (5 marks)

b) A bag contains 8 marbles of which 3 are blue and 5 are red. One marble is drawn at random, its colour is noted and the marble is replaced in the bag. A marble is again drawn from the bag and its colour is noted. Find the probability that the marble will be

i) Blue followed by red (2 marks)

ii) Blue and red in any order (2 marks)

iii) Of the same colour (2 marks)

c) Calculate price index number for 2016 of following data by weighted aggregative method using

i) Laspeyre's method, (3 marks)

ii) Paasche's method, (3 marks)

iii) Fisher's method. (3 marks)

Commodity	Price (2012)	Quantity (2012)	Price (2016)	Quantity (2016)
A	4	20	6	10
B	3	15	5	23
C	2	25	3	15
D	5	10	4	15

QUESTION FOUR (20 MARKS)

a) Suppose X is the height (in inches) of basketball players on all university teams in Kenya during 2023/2024 games. Suppose X is normally distributed with a mean of 75 and variance 36. A random sample of nine players is drawn from this population. What is the probability that the sample average team player height is less than 80 inches? (4 marks)

b) Find the equation of the regression line of the given data. Then use the regression equation to predict the value of y for each of the given x-values. The number of hours 6 students spent on a test and their score on that test are shown below.

Hours spent studying, x	1	2	3	4	5	6
Test score, y	36	42	53	48	65	73

i) Find the regression equation. (5 marks)

ii) Predict the value of y for x = 3. (2 marks)

c) A bag of potato chips is packaged by weight. A total of nine bags are purchased, weighed and the mean weight of these nine bags is 10.5 kg. Suppose that the standard deviation of the population of all such bags of chips is 0.6 kg. The stated population weight is 11 kg. Set a level of significance at 0.01. Does the sample support the hypothesis that true population mean is less than 11 ounces?

i) State the null and the alternative hypothesis (2 marks)

ii) Calculate the test statistics (3 marks)

iii) Determine the critical region (2 marks)

iv) State your decision (2 marks)

QUESTION FIVE (20 MARKS)

a) A survey of 36 selected recording companies showed these numbers of days that it took to receive a shipment from the day it was ordered.

Days	Frequency
1–3	6
4–6	8
7–9	10
10–12	7
13–15	0
16–18	5

Find each of these.

i) Mean (2 marks)

ii) Mode (3 marks)

iii) Median (3 marks)

iv) Variance (4 marks)

v) 22^{nd} percentile (3 marks)

b) Suppose that 80% of all business startups in the IT industry report that they generate a profit in their first year. If a sample of 10 new IT business startups is selected, find the probability that

i) Exactly seven will generate a profit in their first year. (2 marks)

ii) At most two will generate a profit in their first year (3 marks)