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KIRIRI WOMEN'S UNIVERSITY OF SCIENCE AND TECHNOLOGY
UNIVERSITY EXAMINATION, 2023/2024 ACADEMIC YEAR
FIRST YEAR, FIRST SEMESTER EXAMINATION
FOR THE CERTIFICATE IN COMMUNITY DEVELOPMENT AND SOCIAL WORK
CDS 110: BUSINESS CALCULATIONS AND STATISTICS

Date: 19TH APRIL 2023
Time: 8:30AM-10:30AM

INSTRUCTIONS TO CANDIDATES

ANSWER QUESTION ONE (COMPULSORY) AND ANY OTHER TWO QUESTIONS

QUESTION ONE (30 MARKS)

a) Given the matrix $A = \begin{bmatrix} 4 & 3 \\ 2 & 1 \end{bmatrix}$. $k=3$. Find kA (3 Marks)

b) A bag contains 3 white and 4 black balls. A man picks 2 at random. What is the probability of picking 2 black balls? (4 Marks)

c) Ann got an average of 69 from the 5 subjects, 50, 45, 78, x and 80. Find x . (3 Marks)

d) Find out the median from the data given below (4 Marks)

Marks	0-10	10-20	20-30	30-40	40-50
Students	5	16	8	14	7

e) $A = \begin{bmatrix} 3 & 8 \\ 2 & -4 \end{bmatrix}$ $B = \begin{bmatrix} 2 & 3 \\ 5 & 6 \end{bmatrix}$ $C = \begin{bmatrix} 6 & -5 \\ 7 & 8 \end{bmatrix}$
i. $A^T + B$ (2 Marks)

ii. $B + C^T$ (2 Marks)

iii. BA (3 Marks)

f) Solve the following equation, $x^2 - 2x - 3 = 0$ (3 Marks)

g) Find the standard deviation from the following data given below
64, 14, 12, 58, 45, 48, 72, 85 (5 Marks)

h) Solve the following equation by substitution (5 Marks)
 $3x + 2y = 14$
 $2x + 4y = 10$

QUESTION TWO (20 MARKS)

a. Explain the difference between primary and secondary data sources. (4 Marks)

b. The table below shows the masses of people.

Mass (kg)	0-5	5-10	10-15	15-20	20-25	25-30
No. of people	5	12	10	8	6	7

Draw a cumulative frequency curve for the above data. (5 Marks)

Use the graph to estimate:

i. The median mass (2 Marks)

ii. List 3 advantages of median as a measure of central tendency (3 Marks)

c. The data below shows marks of student in a class.

Marks	30-40	40-50	50-60	60-70	70-80	80-90
Frequency	12	8	3	5	11	8

Calculate the following:

i. Q_3 , (3 Marks)

ii. D_5 (3 Marks)

QUESTION THREE (20MARKS)

a) The following data indicates the number of marks student got in a business statistic exam

No of students	0-10	10-20	20-30	30-40	40-50	50-60
Marks	7	12	10	8	5	16

Calculate the;

- (i) P_{20} (4 Marks)
 - (ii) Median (4 Marks)
 - (iii) Mode (2 Marks)
- b) Compute the:
- i. Standard deviation (5 Marks)
 - ii. Coefficient of variation (3 Marks)
- c) List two characteristic of a good average. (2 Marks)

QUESTION FOUR (20MARKS)

a) Solve the following simultaneous equation by Substitution method (5 Marks)

$$3x+2y=8$$

$$5x+5y=15$$

b) Solve the following simultaneous equation by Matrix method (5 Marks)

$$3x+4y=10$$

$$4x+y=13$$

c) Calculate the median from the following data (5 Marks)

Class interval	Frequency
40-50	2
50-60	5
60-70	10
70-80	7
80-90	9
90-100	4

d) A bag contains three black and two yellow balls. A man draws two at random. What is the probability that both balls are yellow? (5 Marks)

QUESTION FIVE (20 MARKS)

a) A bag contains 4 white beads and 3 black beads. A man picks 2 at random. Find the probability that:

- a. Both beads are of same color (3 Marks)
- b. One white and one black (4 Marks)

b) Given two matrices A and B

$$A = \begin{bmatrix} 4 & 2 \\ 3 & 6 \end{bmatrix} \quad B = \begin{bmatrix} 5 & 3 \\ 1 & 6 \end{bmatrix} \quad k = 3$$

Determine the following;

- i. Transpose of A (1 Mark)
- ii. BA (4 Marks)
- iii. $B^T + A$ (2 Marks)
- iv. A^{-1} (3 Marks)
- v. kB (3 Marks)