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**KIRIRI WOMENS' UNIVERSITY OF SCIENCE AND TECHNOLOGY**  
**UNIVERSITY EXAMINATION, 2023/2024 ACADEMIC YEAR**  
**FOR THE CERTIFICATE IN HUMAN RESOURCE MANAGEMENT**  
**CHR 017: BUSINESS CALCULATIONS AND STATISTICS**

Date: 19<sup>TH</sup> 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)

c) Use the graph to estimate;

i) The median mass (2 Marks)

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

d) 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 (20 MARKS)**

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)

$$\begin{aligned} 3x+2y &= 8 \\ 5x+5y &= 15 \end{aligned}$$

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

$$\begin{aligned} 3x+4y &= 10 \\ 4x+y &= 13 \end{aligned}$$

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 pick 2 at random. Find the probability that:

- i) Both beads are of same color (3 Marks)  
 ii) 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 Marks)  
 ii) BA (4 Marks)  
 iii)  $B^T + A$  (2 Marks)  
 iv)  $A^{-1}$  (3 Marks)  
 v)  $kB$  (3 Marks)