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**KIRIRI WOMENS' UNIVERSITY OF SCIENCE AND TECHNOLOGY**  
**UNIVERSITY EXAMINATION, 2022/2023 ACADEMIC YEAR**  
**FOR THE CERTIFICATE IN COMMUNITY DEVELOPMENT AND SOCIAL**  
**WORK**  
**CDS 110- BUSINESS CALCULATION & STATISTICS**

Date: 6<sup>th</sup> December 2022  
Time: 2:30pm-4:30pm

**INSTRUCTIONS TO CANDIDATES**

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

**QUESTION ONE (30 MARKS)**

- a) Solve the following equation  $4x^2 - 4x - 3 = 0$  (3 Marks)
- b) Solve the following simultaneous equations (4 Marks)
- $$\begin{aligned} 5x + 4y &= 3 \\ 2x - 3y &= 1 \end{aligned}$$
- c) Compute median from the following data (2 Marks)  
51, 65, 40, 44, 46, 55, 48, 62
- d) Outline three characteristics of a good measure of dispersion. (3 Marks)
- e) Given below are the Marks obtained by 8 students (4 Marks)  
45, 32, 37, 46, 39, 36, 48 and 36. Find the mean.
- f) From a bag containing 4 white and 5 black balls, a man draws 3 at random. What is the chance of drawing 3 black balls? (4 Marks)
- g) Compute the variance from the following data: 51, 65, 40, 44, 46, 55, 48, 62 (1 Mark)
- h) Given the following matrices  $A = \begin{bmatrix} 8 & 7 \\ 4 & 3 \end{bmatrix}$ ,  $B = \begin{bmatrix} 5 & 2 \\ 1 & 6 \end{bmatrix}$ ,  $C = \begin{bmatrix} 2 \\ 3 \end{bmatrix}$ . Calculate
- i)  $A+B$  (3 Marks)
- ii)  $B-A$  (3 Marks)
- iii)  $AC$  (4 Marks)

**QUESTION TWO (20 MARKS)**

- a) From the following information of cumulative distribution table;

<b>Class Interval</b>	<b>Frequency</b>
56-61	6
61-66	11
66-71	7
71-76	19
76-81	15
81-86	8
86-91	7
91-96	5
96-101	2

Calculate the;

- i) Mean (3 Marks)
  - ii) Median (4 Marks)
  - iii) Mode (2 Marks)
  - iv) Standard variation (5 Marks)
  - v) Co-efficient of variation (3 Marks)
- b) List three advantages of mean as a measure of central tendency. (3 Marks)

**QUESTION THREE (20 MARKS)**

a) From the data given below;

Marks	No. of students
0-20	3
21-40	19
41-60	35
61-80	22
81-100	1

- i) Draw a cumulative frequency distribution table for the above data (5 Marks)  
Use the above data, draw;
  - ii) Histogram (3 Marks)
  - iii) Frequency polygon (3 Marks)
  - iv) Frequency curve (4 Marks)
- b) A bag containing 4 blue and 3 white balls, a man picked 2 at random. What is the probability of picking 2 blue balls? (5 Marks)

**QUESTION FOUR (20 MARKS)**

a) Given two matrices A and B

$$A = \begin{bmatrix} 2 & 3 \\ 1 & 4 \\ 5 & 2 \end{bmatrix} \quad B = \begin{bmatrix} 5 & 3 & 8 \\ 1 & 6 & 2 \end{bmatrix}$$

Determine the following;

- i) Transpose of A (3 Marks)
  - ii) AB (3 Marks)
  - iii)  $B^T + A$  (3 Marks)
  - iv) BA (3 Marks)
- b) Solve by Substitution method; (3 Marks)
- $$3x + 2y = 3$$
- $$5x + 3y = 15$$
- c) Solve by Elimination method; (3 Marks)
- $$4x + 3y = 7$$
- $$3x - 2y = 9$$
- d) Outline two uses of standard as a measure of dispersion. (2 Marks)

**QUESTION FIVE (20 MARKS)**

a) The table below shows the masses of 120 people.

Mass (kg)	0-5	5-10	10-15	15-20	20-25	25-30
No. of people	9	27	32	18	24	10

Compute;

- i) Mean (4 Marks)
- ii)  $Q_3$  (4 Marks)
- iii)  $D_7$  (4 Marks)
- iv)  $P_{30}$  (4 Marks)
- v) Standard deviation (4 Marks)