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**KIRIRI WOMENS' UNIVERSITY OF SCIENCE AND TECHNOLOGY**  
**UNIVERSITY EXAMINATION, 2022/2023 ACADEMIC YEAR**  
**FOR THE CERTIFICATE IN BUSINESS ADMINISTRATION**  
**CHM 203 - BASIC MATHEMATICS**

Date: 26<sup>TH</sup> JULY 2022  
Time: 2:30PM -4:30PM

**INSTRUCTIONS TO CANDIDATES**

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

**QUESTION ONE (30 MARKS)**

- a) State five qualities of a good average. (5 Marks)  
b) The data below shows the marks of student obtained in a given test.

| Marks         | 0-5 | 5-10 | 10-15 | 15-20 | 20-25 |
|---------------|-----|------|-------|-------|-------|
| No of student | 2   | 5    | 10    | 6     | 7     |

Calculate the following;

- i) Mean (3 Marks)  
ii) Median (4 Marks)  
iii) Mode (3 Marks)
- c) Given two matrices A and B;  
 $A = \begin{bmatrix} 5 & 6 \\ 2 & 3 \end{bmatrix}$   $B = \begin{bmatrix} 1 & 3 \\ 2 & 9 \end{bmatrix}$   
Determine the following;  
i) Transpose of A (1 Marks)  
ii) AB (3 Marks)  
iii)  $B^T + A$  (2 Marks)
- d) Solve the following equation  $4x^2 - 7x + 3 = 0$   
i) Formula (3 Marks)  
ii) Factorization (3 Marks)
- e) A bag contains 4 white beads and 3 black beads. A man pick 2 at random. Find the probability that both beads are of same color. (3 Marks)

**QUESTION TWO (20 MARKS)**

The following data shows the marks of student obtained in an exam

| Marks  | No. of student |
|--------|----------------|
| 40-50  | 20             |
| 50-60  | 25             |
| 60-70  | 36             |
| 70-80  | 72             |
| 80-90  | 51             |
| 90-100 | 40             |

- a) Calculate the following;  
i) Mean (3 Marks)  
ii) Median (4 Marks)  
iii) Mode (3 Marks)

- b) Compute for;
- Standard deviation (5 Marks)
  - coefficient of variation (3 Marks)
- c) state TWO advantages of mean as a measure of central tendency. (2 Marks)

**QUESTION THREE (20 MARKS)**

- a) Given two matrices A and B

$$A = \begin{bmatrix} 4 & 3 \\ 1 & 5 \\ 6 & 2 \end{bmatrix} \quad B = \begin{bmatrix} 3 & 7 & 2 \\ 3 & 4 & 5 \end{bmatrix}$$

Determine the following;

- Transpose of A (2 Marks)
  - BA (4 Marks)
  - $B^T + A$  (4 Marks)
- b) The following shows marks obtained by student in a test.

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

Calculate the following from the data above;

- $Q_3$  (5 Marks)
- $P_{30}$  (5 Marks)

**QUESTION FOUR (20 MARKS)**

- a) Solve the following simultaneous equation by;

$$\begin{aligned} 5X + 2Y &= 4 \\ 3X + 4Y &= 6 \end{aligned}$$

- Elimination method (4 Marks)
  - Substitution method (4 Marks)
- b) Solve by Matrix method (5 Marks)
- $$\begin{aligned} 4a + 2b &= 5 \\ 3a + 5b &= 1 \end{aligned}$$
- Outline FOUR qualities of a good measure of dispersion (4 Marks)
  - List THREE advantages of mode as a measure of central tendency (3 Marks)

**QUESTION FIVE (20 MARKS)**

- a) The table below shows the masses of 104 people.

| Mass (kg)     | 0-5 | 5-10 | 10-15 | 15-20 | 20-25 | 25-30 |
|---------------|-----|------|-------|-------|-------|-------|
| No. of people | 9   | 11   | 32    | 18    | 24    | 10    |

Calculate

- Geometric mean (4 Marks)
  - Harmonic mean (4 Marks)
  - Draw a cumulative frequency for the data above (5 Marks)
  - Draw a histogram and superimpose a frequency curve (5 Marks)
- b) Solve the following equation  $4x^2 - 4x - 3 = 0$
- By formula (3 Marks)
  - Factorization (3 Marks)