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KIRIRI WOMENS' UNIVERSITY OF SCIENCE AND TECHNOLOGY
UNIVERSITY EXAMINATION, 2022/2023 ACADEMIC YEAR
FOR THE CERTIFICATE IN HOSPITALITY MANAGEMENT
CHM 203: BASIC MATHEMATICS

Date: 7th December 2022
Time: 11:30am -1:30pm

INSTRUCTIONS TO CANDIDATES

ANSWER QUESTION ONE (COMPULSORY) AND ANY OTHER TWO QUESTIONS

QUESTION ONE (30 MARKS)

- a) Outline four qualities of a good measure of dispersion (4 Marks)
b) The Marks of 15 students of a college in statistics are given below:
49, 62, 51, 74, 55, 80, 56, 64, 34, 42, 56, 67, 10 and 46. Find out the mean mark.

(3 Marks)

- c) Let $A = \begin{pmatrix} 3 & 2 \\ -1 & 6 \end{pmatrix}$ and $B = \begin{pmatrix} 1 & -9 \\ 11 & 6 \end{pmatrix}$. Find $-\frac{4}{7}A - 13B$ (4 Marks)

- d) Monthly earnings of 10 employees of Brookside limited are:
Sh 70000, 11200, 4300, 8100, 6090, 1010, 1500, 1900, 1700, 2000. Calculate the average wage. (4 Marks)

- e) Solve the following equation $4x^2 - 7x + 3 = 0$
i) Formula (3 Marks)
ii) Factorization (3 Marks)

- f) From the data given below calculate

Marks	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45
Number of students	5	6	15	10	5	4	2	2

- i) Mean (4 Marks)
ii) Median (3 Marks)
iii) Mode (4 Marks)
g) 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 colour. (3 Marks)

QUESTION TWO (20 MARKS)

- a) The following data shows the Marks of students obtained in a given exam.

Marks	0-10	10-20	20-30	30-40	40-50
Number of students	7	6	15	12	10

Calculate; (i) Standard deviation (4 Marks)

(ii) Coefficient of variation (3 Marks)

- b) With examples discuss three types of matrices (3 Marks)

- c) The following data relate to sizes of shoes sold at a store during a given week.

Size of Shoes	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5
No of pairs	1	2	4	5	15	30	60	95	82

Find the median size. (3 Marks)

- d) Given two matrices A and B

$$A = \begin{bmatrix} 5 & 6 \\ 2 & 3 \end{bmatrix} \quad B = \begin{bmatrix} 1 & 3 \\ 2 & 9 \end{bmatrix}$$

Determine the following;

- i) Transpose of A (1 Mark)
- ii) AB (3 Marks)
- iii) $B^T + A$ (3 Marks)

QUESTION THREE (20 MARKS)

- a) Calculate the standard deviation from the following data:
192, 288, 236, 229, 184, 260, 348, 291, 330, 242 (3 Marks)
- b) With example explain the meaning of a square matrix. (2 Marks)
- c) From the following grouped frequency distribution.

Class interval	0.0-8.0	8.0-16.0	16.0-24.0	24.0-32.0	32.0-40.0	40.0-48.0
Frequency	8	7	16	24	15	7

- Calculate (i) Mean (4 Marks)
- (ii) Mode (3 Marks)
- d) Solve the following simultaneous equation by;
$$6x + 3y = 4$$
$$5x + 8y = 6$$
 - i) Elimination method (4 Marks)
 - ii) Substitution method (4 Marks)

QUESTION FOUR (20 MARKS)

- a) Calculate the mode from the data given below

Daily wages (Shs)	30-35	35-40	40-45	45-50	50-55	55-60
No. of workers	5	8	10	6	3	2

- (3 Marks)
- b) Compute the median from the following data: 51, 65, 40, 44, 46, 55, 48, 62 (1 Mark)
- c) Kamau got the following Marks in 5 subjects: 75, 55, 48, 72 and x. Determine the value of x if his average mark was 65. (4 Marks)
- d) Solve the following equation $4x^2 - 7x + 3 = 0$
 - i) Completing the square (4 Marks)
 - ii) Factorization (3 Marks)
- e) Find the median wage of the following observations

Wages	20-30	30-40	40-50	50-60	60-70	70-80
Number of workers	3	5	20	10	5	0

(5 Marks)

QUESTION FIVE (20 MARKS)

- a) Given below are the Marks obtain by 9 students; 45, 32, 37, 46, 39, 36, 41, 48 and 36.
Find (i) Standard deviation (2 Marks)
- (ii) Coefficient of standard deviation (3 Marks)
- b) If $A = \begin{pmatrix} 3 & -5 \\ -8 & 1 \end{pmatrix}$ and $B = \begin{pmatrix} 1 & -3 \\ 9 & 8 \end{pmatrix}$, find $2A + \frac{17}{23}B$ (3 Marks)
- c) Solve by Matrix method (4 Marks)

$$4a + 2b = 5$$

$$3a + 5b = 1$$

- d) Find the co-efficient of variation from the following data

Weight (gm)	110-119	120-129	130-139	140-149	150-159	160-169	170-179	180-189
Frequency	5	7	12	20	16	10	7	3

(3 Marks)

- e) From the following grouped frequency distribution.

Class interval	0.0-8.0	8.0-16.0	16.0-24.0	24.0-32.0	32.0-40.0	40.0-48.0
Frequency	8	7	16	24	15	7

Calculate (i) Mean (3 Marks)

(ii) Median (2 Marks)