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KIRIRI WOMEN'S UNIVERSITY OF SCIENCE AND TECHNOLOGY
UNIVERSITY EXAMINATION, 2023/2024 ACADEMIC YEAR
FIRST YEAR, SECOND SEMESTER EXAMINATION
FOR THE DIPLOMA IN ACCOUNTING
DBA 1104: QUANTITATIVE METHODS

Date: 20TH APRIL 2023
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 $2x^2 - 7x - 3 = 0$ (4 Marks)
- b) Solve the following simultaneous equations by using matrix algebra (4 Marks)
- $$5x + 2y = 12$$
- $$3x - 5y = 2$$
- c) Find out the derivative of the following function (4 Marks)
- $$y = (3x^4 + 2)(x^3 - 2x)$$
- d) Compute median from the following data 14,28,50,30,45,32 (2 Marks)
- e) State 3 characteristics of a good measure of dispersion. (3 Marks)
- f) Given below are the marks obtained by 7 students (4 Marks)

50,60,25,37,52,48 and 36. Find the quartile deviation and its co-efficient.

- g) Compute the fixed base index numbers from given data (5 Marks)

YEAR	1990	1991	1992	1993	1994	1995	1996
CONSUMPTION (SH 000)	160	152	139	172	159	170	175

- h) From a bag containing 4 white and 5 black balls, a man draws 3 at random. What is the chance of drawing 3 white balls? (4 Marks)

QUESTION TWO (20 MARKS)

- a) The following marks shows ranks of 15 students in two exams; statistics and accounting (10 Marks)

Students	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Rank by student Accounting	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Rank by student statistics	10	7	2	6	4	8	3	1	11	15	9	5	14	12	13

Calculate spearman rank correlation coefficient and comment on its value

- b) The following data was recorded regarding the stress level from the amount of coffee per day one consumes.

Number of cups(x)	3	2	4	6	5	1	7	3
Stress level(y)	5	3	3	9	4	2	10	5

- i. Determine the regression equation for predicting the stress level from the amount of coffee per day one consume.
- ii. Predict the stress level for someone who drinks 8 cups of coffee a day

QUESTION THREE (20 MARKS)

(a) Compute index numbers for 2022 from the following data taking 2016 as the base and using the following

- i. Laspeyres price index number (3 Marks)
- ii. Paasches price index number (3 Marks)
- iii. Fishers index number (3 Marks)
- iv. Marshall-Edgeworth index (3 Marks)

items	2016		2022	
	Price	Qty	Price	Qty
Rice	30	100	40	120
Wheat	16	80	25	135
Maize	10	150	20	220

(b) The following relates to the number of successful sales made by the sales men employed by a large microcomputer firm in a particular quarter.

No of sales	50-59	60-69	70-79	80-89	90-99	100-109	110-119
No of sales men	7	81	192	312	218	82	18

Compute

- a. Mean (2 Marks)
- b. Median (3 Marks)
- c. Mode (3 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 (1 Marks)
 - ii. AB (3 Marks)
 - iii. $B^T + A$ (3 Marks)
 - iv. $(BA)^{-1}$ (4 Marks)
- b. Solve by Substitution method (4 Marks)
- $$3x + 2y = 3$$
- $$5x + 3y = 15$$
- c. Solve by Elimination method (3 Marks)
- $$4x + 3y = 7$$
- $$3x - 2y = 9$$
- d. Outline 2 uses of range as a measure of dispersion. (2 Marks)

QUESTION FIVE (20 MARKS)

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

Mass (kg)	40-49	50-59	60-69	70-79	80-89	90-99
No. of people	9	27	32	18	24	10

Compute

- i. Range (3 Marks)
- ii. Quartile deviation (3 Marks)
- iii. Mean deviation (4 Marks)
- iv. Standard deviation (4 Marks)
- v. Geometric mean (3 Marks)
- vi. Harmonic mean (3 Marks)