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KIRIRI WOMENS' UNIVERSITY OF SCIENCE AND TECHNOLOGY
UNIVERSITY EXAMINATION, 2022/2023 ACADEMIC YEAR
FIRST YEAR, FOURTH SEMESTER, END OF SEMESTER EXAM
FOR THE DIPLOMA IN INFORMATION TECHNOLOGY
DBA 1104- QUANTITATIVE METHODS

Date: 3RD AUGUST 2022
Time: 2:30PM – 4:30PM

INSTRUCTIONS TO CANDIDATES

ANSWER QUESTION ONE (COMPULSORY) AND ANY OTHER TWO QUESTIONS

QUESTION ONE (30 MARKS)

- a) Given a set of data: 2,9,8,4,7,6, calculate the variance. (3 Marks)
- b) Determine the derivative of each of the following polynomial functions with respect to x
- i) $y = (4x^2 - 5x^3)(6x + 4)$ (4 Marks)
- c) The following data shows marks obtained by student during a test;

Marks	10	15	20	25	30	35	40
No. of student	5	10	8	11	9	4	6

Calculate the following;

- i) Mean (3 Marks)
- ii) Median (4 Marks)
- iii) Mode (2 Marks)
- d) A bag containing 3 white and 4 black balls. A man picks 2 at random with replacement. What is the probability of picking 2 black balls? (4 Marks)
- e) Given the matrices $A = \begin{bmatrix} 3 & 8 \\ 5 & 2 \end{bmatrix}$, $B = \begin{bmatrix} 4 & 6 \end{bmatrix}$ $C = \begin{bmatrix} 6 & 1 \\ -1 & 2 \end{bmatrix}$
- Determine;
- i) BA (2 Marks)
- ii) A+C (2 Marks)
- f) Construct simple index number from numbers from the following data by using;
- i) Fixed base method (1989 as base year). (3 Marks)
- ii) Chain base method (3 Marks)

Year	1989	1990	1991	1992	1993	1994	1995	1996
Price (Sh 000)	70	80	50	40	60	78	100	120

QUESTION TWO (20 MARKS)

- a) The following data have been collected regarding sales and advertising expenditure

Sales (Sh. M)	8	9	7	8	9	10
Advertising expenditure (Sh. M)	21	25	29	33	37	41

Calculate the Karl Pearson's correlation coefficient between sales revenue and advertising expenditure. Comment on the results. (10 Marks)

b) The following data give the test scores and sales made by 9 salesmen during the last one year

Test scores	14	19	24	21	26	22	15	20	19
Sales (millions)	31	36	48	37	50	45	33	41	39

Obtain;

- i) The regression equation of test scores on sales (5 Marks)
- ii) The regression equation of sales on test scores (5 Marks)

QUESTION THREE (20 MARKS)

Wages	30-39	40-49	50-59	60-69	70-79	80-89
No of employees	8	10	5	11	4	3

Find out the following;

- i) Mean (2 Marks)
- ii) Median (3 Marks)
- iii) Quartile deviation (4 Marks)
- iv) Mode (3 Marks)
- v) Standard deviation (5 Marks)
- vi) Coefficient of variation (3 Marks)

QUESTION FOUR (20 MARKS)

a) From the following data, calculate index numbers for 2007 taking 2000 as the base and using the following formulae:

- i) Laspeyre's method (3 Marks)
- ii) Paasche method (3 Marks)
- iii) Fisher method (4 Marks)
- iv) Marshall-Edgeworth method (4 Marks)

Commodity	2000		2007	
	Prices (Shs)	Quantity (Bags)	Price (Shs)	Quantity (Bags)
Maize	65	20	135	30
Wheat	95	8	160	7
Beans	150	5	320	8

b) Solve the following equations using the stated method;

$$4x - 2y = 6$$

$$3x + 4y = 3$$

- i) Elimination method (3 Marks)
- ii) Substitution method (3 Marks)

QUESTION FIVE (20 MARKS)

- a) Outline THREE properties of a good measure of dispersion. (3 Marks)
- b) An examination of eight applicants for clerical post was taken by a firm. From the marks obtained by the applicants in the Accountancy and Statistics papers, compute rank coefficient of correlation.

Applicant	A	B	C	D	E	F	G	H
Marks in Accountancy	15	20	28	12	40	60	24	80
Marks in Statistics	40	32	50	35	20	10	30	60

- (8 Marks)
- c) Solve the following equation by matrix method; (5 Marks)
- $$4x - y = 5$$
- $$3x + 2y = 6$$
- d) Solve the following quadratic equation; $3x^2 - 7x + 2 = 0$
- (4 Marks)