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KIRIRI WOMENS' UNIVERSITY OF SCIENCE AND TECHNOLOGY
UNIVERSITY EXAMINATION, 2022/2023 ACADEMIC YEAR
DIPLOMAIN BUSINESS INFORMATION TECHNOLOGY
DIT1003 - COMPUTATIONAL MATHEMATICS:

Date: 14th April, 2022
Time: 8.30 am – 10.30am

INSTRUCTIONS TO CANDIDATES
ANSWER QUESTIONONE (COMPULSORY) AND ANYOTHER TWO QUESTIONS

QUESTION ONE (30MARKS)

a) Find the first derivatives of the function below
Y= x^{-5} +2x-6 (2Marks)

b) From the following data, 756,726,710,568,564,440, 440. Calculate the median (2Marks)

c) Solve the following equation by elimination (3Marks)

$$4p - q = 10$$
$$2p + 3q = 6$$

d) From the data given below;

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

Compute,
i) Mean (2 Marks)
ii) Median (3 Marks)
iii) Mode (2 Marks)

e) Convert $475_{10}$to binary (3 Marks)

f) Convert 110101100_2 to decimal (3 Marks)

g) A man throws a six-sided dice two times n a row. What is the probability that he,
i) Gets two sixes (2 Marks)
ii) Gets no six (2 Marks)

h) Given the matrices A=$\begin{bmatrix} -1 & 5 & 0 \\ 0 & -2 & 3 \end{bmatrix}$, B= $\begin{bmatrix} -8 & 1 \\ 2 & 4 \\ -4 & 1 \end{bmatrix}$

Determine
i) A^T+B (3 Marks)
ii) $A * B$ (3 Marks)

QUESTION TWO (20MARKS)

a) From the following information of cumulative distribution table

Class Interval	*Frequency*
56-60	6
61-65	11
66-70	7
71-75	19
76-80	15
81-85	8
86-90	7
91-95	5
96-100	2

Calculate the;

i) Mean (3 Marks)
ii) Median (4 Marks)
iii) Mode (2 Marks)

b) Compute for
i) Standard variation (5Marks)
ii) Co-efficient of variation (3Marks)

c) List three advantages of mean deviation. (3Marks)

QUESTION THREE (20MARKS)

a) A student keeps 10 pens in a drawer. Although the pens all look the same, 2 of them have red ink, 3 of them have black ink, and the remainder have blue ink. The student takes two pens from the drawer at random. Assuming that the pens are not replaced:
i) Draw a probability tree to show the possible outcomes from two picks. (4 Marks)
ii) Find the probability of picking both of the pens that have red ink. (2 Marks)
iii) Find the probability of picking at least one pen with black ink. (2 Marks)

b) Given two matrices A and B

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

Determine the following;
i) Transpose of A (3 Marks)
ii) AB (3 Marks)
iii) B^T+A (3 Marks)
iv) $(BA)^{-1}$ (3 Marks)

QUESTION FOUR (20 MARKS)

a) Convert each of t following number system to their respective equivalents
i) 21.265_{10} to binary (2 Marks)
ii) $2AE_{16}$ to denary (2 Marks)
iii) 16.62_8 to binary (2 Marks)
iv) 684_{10} to hexadecimal (2 Marks)

b) Solve by Matrix method (5 Marks)

$$3x - 4y = 6$$
$$2x + 2y = 4$$

c) Solve by Subtraction method (5 Marks)
4x+3y=7
3x-2y=9

QUESTION FIVE (20 MARKS)

a) Discuss five characteristic of a good measure of dispersion (5 Marks)

b) The final Marks for ICT of 80 students at Kiriri university are recorded in the following table

68,84,75,82,68,90,62,88,76,93,73,79,88,73,60,93,71,
59,85,75,61,65,75,87,74,62,95,78,63,72,66.78,82,75,
94,77,69,74,68,60,96,78,89,61,75,95,60,79,83,71,79,
62,67,97,78,85,76,65,71,75,65,80,73,57,88,78,62,76,
53,74,86,67,73,81,72,63,76,75,85,77

Draw a cumulative frequency distribution table for the above data (5 Marks)
Use the above data, draw
i) Histogram (3Marks)
ii) Frequency polygon (3Marks)
iii) Frequency curve (4Marks)