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KIRIRI WOMENS' UNIVERSITY OF SCIENCE AND TECHNOLOGY
UNIVERSITY EXAMINATION, 2022/2023 ACADEMIC YEAR
FIRST YEAR, FIRST SEMESTER END OF SEMESTER EXAM
FOR THE DIPLOMA IN BUSINESS INFORMATION TECHNOLOGY
DIT 1003- COMPUTATIONAL MATHEMATICS

Date: 28TH JULY 2022
Time: 8:30AM – 10:30AM

INSTRUCTIONS TO CANDIDATES

ANSWER QUESTION ONE (COMPULSORY) AND ANY OTHER TWO QUESTIONS

QUESTION ONE (30 MARKS)

- a) List FOUR advantages of mean as a measure of central tendency. (4 Marks)
- b) Express the number 747_8 in:
- i) Binary (3 Marks)
- ii) Denary (2 Marks)
- iii) Hexadecimal (3 Marks)
- c) A bag contains 4 white balls and 3 red balls, 2 balls are drawn at random. What is the probability that one is white and the other is red? (4 Marks)
- d) Solve the following quadratic equation $4x^2 - 10x + 6 = 0$. (2 Marks)
- e) Use substitution method to solve the simultaneous equations (5 Marks)

$$2x + y = 6$$

$$4x - 2y = 4$$

- f) The following relates to the marks obtained by the number of student at KWUST.

Marks	0-10	10-20	20-30	30-40	40-50	50-60
No. of student	3	4	10	8	11	6

Required

Calculate the median mark. (3 Marks)

- g) Differentiate the following function $y = 5x^4 - 2x^{-3} + 5$ (3 Marks)

- h) Given the matrices $A = \begin{bmatrix} 4 & 5 & 3 \\ 6 & -3 & 7 \end{bmatrix}$, $B = \begin{bmatrix} 5 & 3 \\ 1 & 6 \\ -5 & 9 \end{bmatrix}$

Determine

- i) B^T (1 Marks)
- ii) $A^T + B$ (2 Marks)
- iii) AB (2 Marks)

QUESTION TWO (20 MARKS)

a) Solve the following equations

$$5x - 3y = 6$$

$$4x + 4y = 8$$

i) Elimination method

(3 Marks)

ii) Substitution method

(3 Marks)

b) Solve by Matrix method

(4 Marks)

$$2x - 3y = 2$$

$$x + 2y = 4$$

c) Solve the equation $3x^2 - 7x + 4 = 0$

i) By formula

(3 Marks)

ii) By factorization

(3 Marks)

d) A bag contains 4 white and 3 blue balls. The balls are identical in all aspect except the color. Three balls were picked at random one at a time. Determine the probability that 3 balls picked were blue.

(4 Marks)

QUESTION THREE (20 MARKS)

a) The number of telephone calls received daily in a marketing department of a company for 62 days are given below;

Age group	30-39	40-49	50-59	60-69	70-79	80-89	90-99
No of persons	8	11	13	7	10	9	4

Calculate the;

i) Mean

(3 Marks)

ii) Median

(4 Marks)

iii) Mode

(2 Marks)

b) Compute

i) Standard variation

(5 Marks)

ii) Co-efficient of variation

(3 Marks)

c) List three advantages of median.

(3 Marks)

QUESTION FOUR (20 MARKS)

a) Convert each of the following number system to their respective equivalents

i) 111010010_2 to decimal

(3 Marks)

ii) $15A_{16}$ to decimal

(3 Marks)

iii) 1017_8 to decimal

(3 Marks)

iv) 167_{10} to Binary

(3 Marks)

b) The data below shows the marks of student obtained in a given test.

Marks	0-10	10-20	20-30	30-40	40-50
No of student	3	8	11	6	9

Calculate the following

i) Mean

(2 Marks)

ii) Median

(3 Marks)

iii) Mode

(3 Marks)

QUESTION FIVE (20 MARKS)

a) Given two matrices A and B

$$A = \begin{bmatrix} -1 & 5 \\ 0 & 3 \\ 6 & 8 \end{bmatrix} \quad B = \begin{bmatrix} -4 & 3 & 0 \\ 0 & 3 & 2 \end{bmatrix}$$

Determine the following;

- i) Transpose of A (1 Marks)
 - ii) $A^T B^T$ (3 Marks)
 - iii) $B^T + A$ (3 Marks)
- b) Solve the following equation $4x^2 - 7x + 3 = 0$
- i) Formula (3 Marks)
 - ii) Factorization (3 Marks)
- c) State FIVE qualities of a good average (5 Marks)
- d) State TWO types of matrices (2 Marks)