



Kasarani Campus

Off Thika Road  
Tel. 2042692 / 3

P. O.

Box 49274, 00100

NAIROBI

Westlands Campus  
Pamstech House  
Woodvale Grove  
Tel. 4442212  
Fax: 4444175

**KIRIRI WOMEN'S UNIVERSITY OF SCIENCE AND TECHNOLOGY**  
**UNIVERSITY EXAMINATION, 2023/2024 ACADEMIC YEAR**  
**FIRST YEAR, FIRST SEMESTER EXAMINATION**  
**FOR THE DIPLOMA IN INFORMATION COMMUNICATION TECHNOLOGY**  
**DIT 1003 – COMPUTATIONAL MATHEMATICS**

Date: 16<sup>TH</sup> AUGUST 2023  
Time: 11:30AM – 1:30PM

**INSTRUCTIONS TO CANDIDATES**

**ANSWER QUESTION ONE (COMPULSORY) AND ANY OTHER TWO QUESTIONS**

**QUESTION ONE (30 MARKS)**

- a) Find out the value of mean from the data given below  
45,12,22,15,60,35,28,10 (2 Marks)
- b) Convert the following number system:  
i)  $1542_{10}$  to Binary (3 Marks)  
ii)  $111010_2$  to Denary (3 Marks)  
iii)  $67423_{10}$  to 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 elimination 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	6	10	5	8	1	7

**Required**

- Calculate the median mark (3 Marks)
- g) Differentiate the following function  $y = (x^2 - 4 - 2x^2)(5x)$  (3 Marks)
- h) Given the matrices  $A = \begin{bmatrix} 2 & 5 & 6 \\ 4 & -3 & 8 \end{bmatrix}$ ,  $B = \begin{bmatrix} 3 & 4 \\ 2 & 5 \\ -5 & 6 \end{bmatrix}$   
Determine  
i)  $B^T$  (1 Marks)  
ii)  $A^T + B$  (2 Marks)  
iii)  $AB$  (2 Marks)

**QUESTION TWO (20MARKS)**

a) Solve the following equations

$$\begin{aligned} 3x - 5y &= 6 \\ 4x + 4y &= 8 \end{aligned}$$

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

b) Solve by Matrix method

$$\begin{aligned} 3x - 2y &= 2 \\ 2x + y &= 4 \end{aligned}$$

(4 Marks)

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

- i) By formula (3 Marks)
- ii) By completing squares (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 (20MARKS)**

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

Age group	0-20	20-40	40-60	60-80	80-100	100-120	120-140
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 for

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

c) Integrate with respect to x:  $\int 6x(4x^2 + 5 + 6x^3 - 7) dx$  (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)  $18A_{16}$  to decimal (3 Marks)
- iii)  $2017_8$  to decimal (3 Marks)
- iv)  $267_{10}$  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	6	8	13	9	2

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

$$A = \begin{bmatrix} 95 \\ 102 \\ 43 \end{bmatrix} \quad B = \begin{bmatrix} -6 & 10 \\ 17 & 2 \end{bmatrix}$$

Determine the following;

- i) Transpose of A (1 Marks)
  - ii)  $A^T B$  (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 5 qualities of a good average (5 Marks)
- d) Differentiate between diagonal matrix and unit matrix (2 Marks)