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KIRIRI WOMENS' UNIVERSITY OF SCIENCE AND TECHNOLOGY
UNIVERSITY EXAMINATION, 2022/2023 ACADEMIC YEAR
CERTIFICATE IN INFORMATION TECHNOLOGY
CIT1003:COMPUTATIONAL MATHEMATICS

INSTRUCTIONS TO CANDIDATES
ANSWER QUESTIONONE (COMPULSORY) AND ANYOTHER TWO QUESTIONS
QUESTION ONE (30MARKS)

a) List 4 qualities of a good average. (4marks)

b) A bag contains 5 green balls and 7 red balls, 2 balls are drawn at random. What is the probability that one is green and the other is red? (4marks)

c) Find the first derivative, y= $x^{-5} + 6x - 2$ (2marks)

d) Solve the following quadratic equation $2x^2 + 4x = 16$. (2marks)

e) Use eliminationmethod to solve the simultaneous equations (5marks)

$$x + 4y = 5$$
$$4x - 2y = 3$$

f) The following relates to the marks obtained by the number of studentat 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 mean marks (3 Marks)

g) Convert $846_{10}$to binary (3Marks)

h) Convert 1110010011_2 to decimal (3 Marks)

i) Given the matrices A=$\begin{bmatrix} 2 & 3 \\ 1 & 4 \\ 5 & 2 \end{bmatrix}$, B= $\begin{bmatrix} 5 & 3 & 8 \\ 1 & 6 & 2 \end{bmatrix}$

Determine

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

QUESTION TWO(20MARKS)

(a) Solve the following equations

$$4x+2y=10$$

$$3x - 5y = 1$$

i. Elimination method (3marks)

ii. Substitution method (3marks)

(b) Solve by Matrix method (4Marks)

$$3x + 4y = 5$$
$$5x + 8y = 9$$

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

i. By formula (3marks)

ii. By factorization (3marks)

(d) A bag contain 6 red, 4 white and 8blue balls. The balls are identical in all aspect except the color. Three balls were picked at random one at a time with replacement. Determine the probability that of the three balls picked, two are blue and one white in colour. (4marks)

QUESTION THREE (20MARKS)

(a) The number of telephone calls received daily in a marketing department of a company for 200 days are given below;

Age group	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64
No of persons	25	75	140	130	145	120	90	55	20

Calculate the;

(i) Mean (3 Marks)

(ii) Median (4 Marks)

(iii) Mean deviation (2 Marks)

(b)Compute for

(i)Standard variation (5Marks)

(ii) Co-efficient of variation (3Marks)

c) List three advantages of mode. (3Marks)

QUESTION FOUR (20 MARKS)

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

i. 101 101 101 Binary to Denary

ii. DAB Hexadecimal to Denary

iii. 2839 Denary to Hexadecimal

iv. 7453 Octal to decimal

b. Given two matrices A and B

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

Determine the following;

i. Transpose of A (3 marks)
ii. AB (3marks)
iii. B^T+A (3marks)
iv. $(BA)^{-1}$ (3marks)

QUESTION FIVE (20 MARKS)

a. Discuss fouradvantages of a standard deviation. (4Marks)

b. 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

Calculate the following,

i. Mode (4Marks)
ii. Q_3, (3marks)
iii. D_4 (3marks)
iv. P_{40} (3marks)

c. Solve the following equation $12x - x^2 - 20$ (3marks)