PAN AFRICA CHRISTIAN UNIVERSITY

DIPLOMA IN INFORMATION, COMMUNICATION AND TECHNOLOGY

END OF SEMESTER EXAMINATION

DEPARTMENT:	**COMPUTING AND INFORMATION TECHNOLOGY**
COURSE CODE:	**DICT0114**
COURSE TITLE:	**FOUNDATION MATHEMATICS**
CAMPUS:	**ROYSAMBU**
EXAM DATE:	**MONDAY 2ND DECEMBER ,2024**
TIME:	**2:00PM -5:00PM**

INSTRUCTIONS

- This exam script has **TWO (2)** sections.
- Read all questions carefully before attempting.
- Answer All questions in Section **A** and any other Three questions in Section **B.**
- Write only your **student number** on the answer booklet provided.

SECTION A

(Answer ALL questions in this section)

Question 1:

The earning per share (in Ksh) for KCB is presented below with a frequency distribution table.

Earnings per share (Ksh)	Frequency
65 – 69	3
70 – 74	4
75 – 79	11
80 – 84	15
85 – 89	9
90 – 94	5
95 – 99	3

Calculate: **[10 marks]**

i. The mean
ii. The median
iii. The mode
iv. Standard deviation
v. Variance

SECTION B

(Answer any THREE (3) questions in this section)

Question 2:

a) i) The universal set U = {0, 1, 2, 3, 4, 5, 6, 7, 8, 9}. Set A is a subset of U consisting of all the prime numbers in set U, A = {2, 3, 5, 7}. The complement of set A is A′ = {0, 1, 4, 6, 8, 9}. **[3 marks]**

ii) Sets U = {0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12}, A = {0, 1, 2, 3, 4, 5, 6}, B = {0, 2, 4, 6, 8, 10, 12}, and C = {0, 3, 6, 9, 12}. Find (A∩B)∩C. **[4 marks]**

b) Write the following rational numbers in their lowest terms: **[3 marks]**

i. -24/192

ii. 12/168

iii. -21/49

Question 3:

Construct truth tables to determine the truth value of the following compound statements**: [10 marks]**

i. $\neg(p \vee r) \wedge q$

ii. $p \wedge r \leftrightarrow \neg q$

Question 4:

a) Simplify the following expressions:

i. $x^2 + 5x + 3x^2 + x^3 - 5 + 3$. **[3 marks]**

ii. Simplify: $(5a^2 - 3a + 1) - (2a^2 - 4a + 6)$. **[3 marks]**

b) Solve for x in the equation $x^2-5x+6=0$ using factorization method. **[4 marks]**

Question 5:

a) Determine if C = $\begin{pmatrix} 1 & 3 \\ 2 & 0 \end{pmatrix}$ is singular and find its inverse. **[4 marks]**

b) Find the determinant of B = $\begin{bmatrix} 1 & 2 & 4 \\ 3 & 2 & 1 \\ -1 & 4 & 3 \end{bmatrix}$ **[6 marks]**

Question 6:

A lecture on public health is held and 300 people attend. They are classified as follows:

GENDER	DOCTORS	NURSES	TOTAL
MALE	100	20	120
FEMALE	90	90	180
TOTAL	190	110	300

Find the probabilities when; **[10 marks]**

i. a female is chosen
ii. a nurse is chosen
iii. a male is chosen
iv. a female nurse is chosen
v. a male doctor is chosen

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