PAN AFRICA CHRISTIAN UNIVERSITY

CERTIFICATE IN INFORMATION AND COMMUNICATION TECHNOLOGY

END OF SEMESTER EXAMINATION

DEPARTMENT:	**COMPUTING AND INFORMATION TECHNOLOGY**
COURSE CODE:	**CICT 0114**
COURSE TITLE:	**ELEMENTARY MATHEMATICS**
CAMPUS:	**ROYSAMBU**
EXAM DATE:	**FRIDAY, 5TH APRIL 2024**
TIME:	**8:00 AM - 11:00AM**

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:

a) Determine which numbers in the set are: **[4 marks]**

i. Natural numbers
ii. Whole numbers
iii. Integers
iv. Rational numbers

-8, 9, $\frac{-8}{3}$, 0, ¾

b) Express 0.253 in the form $\frac{a}{b}$, where a and b are integers. **[2 marks]**

c) Given that A and B are sets, express [A∩(A'∩B)']' **[4 marks]**

SECTION B

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

Question 2:

a) Calculate the number of subsets in set A = {1, 3, 5, 7}. **[2 marks]**

b) Find A∪(B∪C), if A = {1, 3, 5}, B = {2, 4, 6}, and C = {1, 5, 7}. **[3 marks]**

c) Construct the truth table for the following statement: **[5 marks]**

(p ∨ q) ∨ ~q

Question 3:

a) Write -21/49 in its lowest form. **[1 mark]**

b) Write two equivalent forms of the following rational numbers: **[4 marks]**

i. 3/17
ii. -5/9

c) Simplify: 2x + 4[2 – (5x – 3)] **[3 marks]**

d) Solve: |3x – 4| = 5 **[2 marks]**

Question 4:

a) Consider the experiment of rolling a die. Let A be the event 'getting a prime number', B be the event 'getting an odd number'. Write the sets representing the events:

i. A or B **[2 marks]**
ii. A and B **[2 marks]**
iii. A but not B **[2 marks]**
iv. 'not A'. **[1 mark]**

b) The monthly test scores of a student are given below:

Test	1	2	3	4	5
% Marks	69	71	73	68	74

Based on the above table, find the probability of the student scoring more than 70% in a test. **[3 marks]**

Question 5:

a) Let A = $\begin{bmatrix} 2 & 3 & 4 \\ -1 & 1 & -1 \end{bmatrix}$ and B = $\begin{bmatrix} 7 & 1 \\ -1 & 1 \\ 2 & -3 \end{bmatrix}$ be two matrices. Find matrix BA. **[5 marks]**

b) Find $\frac{dy}{dx}$ for each of the following: **[5 marks]**

i. $y = (x^2 - 1)^3$

ii. $y = \frac{3x - 2}{1 - 4x}$

Question 6:

A random sample of the life expectancy of residents of for 25 countries in Africa was selected and the following distribution was obtained:

Class	Frequency
48 – 47	2
48 – 52	2
53 – 57	3
58 – 62	3
63 – 67	4
68 – 72	6
73 – 77	3
78 – 82	2

Calculate: **[10 marks]**

i. The mean
ii. The mode
iii. The median
iv. The standard deviation

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