PAN AFRICA CHRISTIAN UNIVERSITY

CERTIFICATE IN INFORMATION AND COMMUNICATION TECHNOLOGY

END OF SEMESTER EXAMINATION

DEPARTMENT: **COMPUTING AND INFORMATION TECHNOLOGY**

COURSE CODE: **CICT0114**

COURSE TITLE: **ELEMENTARY MATHEMATICS**

EXAM DATE: **XXXXX XXXXX/DECEMBER,2021**

TIME: **XXXXX**

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) Convert the following: **[4 Marks]**

i. 1010110101_2 to hexadecimal equivalent

ii. 245_{10} to binary number

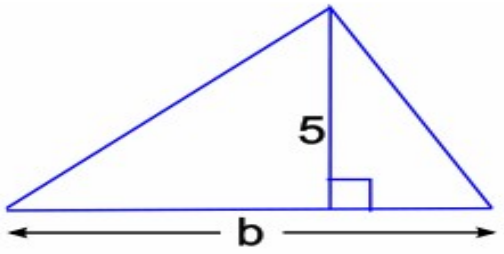
b) Using the matrices below, calculate A+B. **[2 Marks]**

$$A = \begin{bmatrix} 3 & 7 \\ 4 & 2 \end{bmatrix} \quad B = \begin{bmatrix} 3 & -2 \\ 7 & 6 \end{bmatrix}$$

c) Given the set A = {1,2,3}. Find P(A) **[2 Marks]**

d) The area of the triangle below is 22.5 cm^2. Calculate the length of the base of the triangle.

[2 Marks]



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

Question 2:

a) Consider the following universal set U= {1, 2, 3, 4, 5, 6, 7, 8, 9, 10},

A = {1, 3, 4, 5}, B = {4, 5, 6, 2} and C = {1, 5, 7, 10}

Find the following:

i. $(A \cap B)'$ **[2 Marks]**

ii. $(A \cup B) \cap C$ **[2 Marks]**

iii. $A \cap (B \cap C)$

[3 Marks]

b) Find the radius of a circle if its area is 120 M^2. (Round your answer to the nearest hundredth). **[3 Marks]**

Question 3:

a) Construct the truth table of $\neg p \wedge q$. **[4 Marks]**

b) Prove that the proposition $(p \longrightarrow q) \wedge (p \longrightarrow r) \equiv p \longrightarrow (q \wedge r)$ is a Logical Equivalence. **[6 Marks]**

Question 4:

Wananchi Agency Limited deals with the distribution of three types of newspapers namely: Neno, Imani and Upendo. The company recently conducted a market survey to determine the newspaper preferences of 100 households in a certain town. The following results were obtained from the survey.

48 Households read Neno newspaper

18 Households read Imani newspaper

26 Households read Upendo newspaper

8 Households read Neno and Upendo newspapers

8 Households read Neno and Imani newspapers

3 Households read Upendo and Imani newspapers

3 Households read the three newspapers

a) Represent the above information using a venn diagram. **[4 Marks]**

b) Find the number of households that:

i. Read only one of the newspaper. **[2 Marks]**

ii. Read Upendo newspaper and the Imani newspaper but did not read the Neno newspaper. **[2 Marks]**

iii. Read none of the newspapers. **[2 Marks]**

Question 5:

a) Evaluate the following: **[4 Marks]**

i. ${}^{8}P_{3}$

ii. ${}^{12}C_{6}$

b) There are 6 oranges, 5 apples and 8 mangoes in a basket. Peter picked 3 oranges, 2 apples and 4 mangoes from the basket. Find the number of choices peter has in selection of fruits. **[3 Marks]**

c) There are 8 men and 10 women and you need to form a committee of 5 men and 6 women. Compute in how many ways can the committee be formed. **[3 Marks]**

Question 6:

a) Given the following arithmetic sequence 2, 7, 12, 17… Calculate the:

i. 10^{th} term **[2 Marks]**

ii. sum of first 12 terms of the arithmetic sequence **[3 Marks]**

b) Find the determinant of the 3×3 matrix below. **[5 Marks]**

$$\begin{bmatrix} 2 & -3 & 1 \\ 2 & 0 & -1 \\ 1 & 4 & 5 \end{bmatrix}$$

EOF

