

PAN AFRICA CHRISTIAN UNIVERSITY

DIPLOMA IN INFORMATION AND COMMUNICATION TECHNOLOGY

END OF SEMESTER EXAMINATION

DEPARTMENT: COMPUTING AND INFORMATION TECHNOLOGY
COURSE CODE: DICT 0113
COURSE TITLE: PRINCIPLES OF PROGRAMMING & ALGORITHMS
CAMPUS: ROYSAMBU
EXAM DATE: THURSDAY, 1ST AUGUST 2024
TIME: 14:30 PM - 17:30 PM

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) Differentiate the following as used in C programming: **[6 marks]**

- i. Reserved word and Identifier
- ii. Data type and Operator
- iii. printf and scanf

b) Write a C program that prompts for the input of two integer values, determines if they are both even and if they are, the program outputs, "**the numbers are even**". **[4 marks]**

SECTION B

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

Question 2:

a) Suppose a, b, and c are integer variables that have been assigned the values a=2, b=4 and c=6. Determine the value of each of the following expressions: **[4 marks]**

- i. $2 * b + 3 * (a - c)$
- ii. $(a * c) \% b$

b) Identify four benefits of flowcharts in programming. **[4 marks]**

c) Define operator precedence and explain its role in solving an expression. **[2 marks]**

Question 3:

a) Explain with the aid of a flowchart the execution of a **do...while** loop. **[6 Marks]**

b) Using any loop structure, write a C program that prints out the numbers below: **[4 mark]**

10, 15, 20, 25, 30

Question 4:

- a) Identify the syntax errors in the following program. After making corrections, what output would you expect when it is executed? **[4 marks]**

```
#include <stdio.h>
#define PI 3.14159
int Main () {
    Int R, C
    Float perimeter
    Float area;
    C = PI
    R = 5;
    Perimeter = 2.0 * C * R;
    Area = C * R * R;
    Printf("%d", $perimeter, $area)
}
```

- b) Discuss control structures under the following categories: **[6 marks]**
- Decision-making/branching
 - Looping/iteration
 - Sequential

Question 5:

- a) A salesperson for Samsung handsets earns a basic salary of 20, 000, a commission of 2% on all total sales in a month, and a bonus of 300 for every handset sold during the month. During the month of June, he sold 25 handsets. Write a C program to calculate the gross salary for the salesperson at the end of the month when the number of handsets sold is keyed in. **[6 marks]**
- b) Differentiate between a pseudocode and a flowchart; give an example in each case **[4 marks]**

Question 6:

- a) Using a function, write a C program to input two numbers as argument and returns the value of their sum. **[6 marks]**
- b) Define the following terms: **[4 marks]**
- i. Linker
 - ii. Interpreter

END