



PAN AFRICA CHRISTIAN UNIVERSITY

(DIPLOMA IN INFORMATION COMMUNICATION TECHNOLOGY)

END OF TERM EXAMINATION

DEPARTMENT: COMPUTING & INFORMATION TECHNOLOGY

COURSE CODE: DICT 0113

CAMPUS: ROYSAMBU

COURSE TITLE: PRINCIPLES OF PROGRAMMING AND ALGORITHMS

EXAM DATE: MONDAY, (12TH APRIL 2021)

TIME: START HOUR – END 02:30-05 :30 HRS

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**.
- None programmable calculators permitted
- Calculators on phones, tablets and computers are NOT permitted in Theory Papers

SECTION A
(Answer ALL questions in this section)

SECTION A (10 Marks)

Question 1:

- a) Below is a C program to calculate sum of two numbers. The program contains errors. Re-write the program correcting the errors **(6 Marks)**

```
#include<stdio>
void mane()
{
char a,b,c;
print("Please enter any two numbers: \n");
scanf("%d %d", &a, &b);
c = a - b;
printf("The addition of two number is: %d", c);
```

- b) Janet, a computer programmer intends to create a program using C programming language. State the program development stage in which she could
- Create flowcharts
 - Chose the identifiers
 - Check whether the program is giving the desired results
 - Adjust the program to meet new demands
- (4 Marks)**

SECTION B

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

Question 2:

- a) Below is a C program. Write the expected output when the program executes
(4

Marks)

```
#include <stdio.h>

int main() {

    int a = 30;

    int b = 20;

    int c = 25;

    int d = 15;

    int e;

    e = (a + b) * c / d;

    printf("Value of (a + b) * c / d is : %d\n", e);

    e = a + (b * c) / d;

    printf("Value of a + (b * c) / d is : %d\n", e);

    return 0;

}
```

- b) Two programmers share the work of creating a program among themselves
(6

Marks)

- i. Explain the programming approach that they are using

- ii. Outline three advantages of this approach

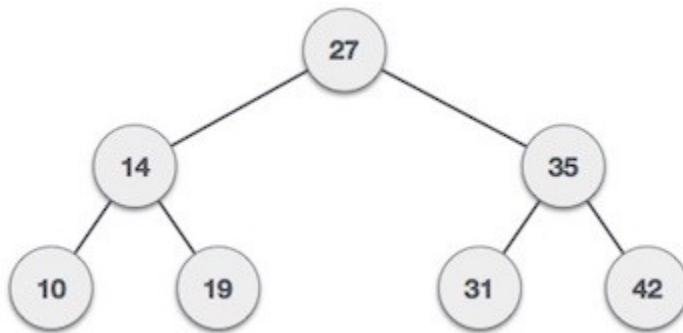
Question 3:

- a) Write a C program code that would prompt a user to enter 5 integer numbers. The program should then sum up the numbers and display the results.

(6

Marks)

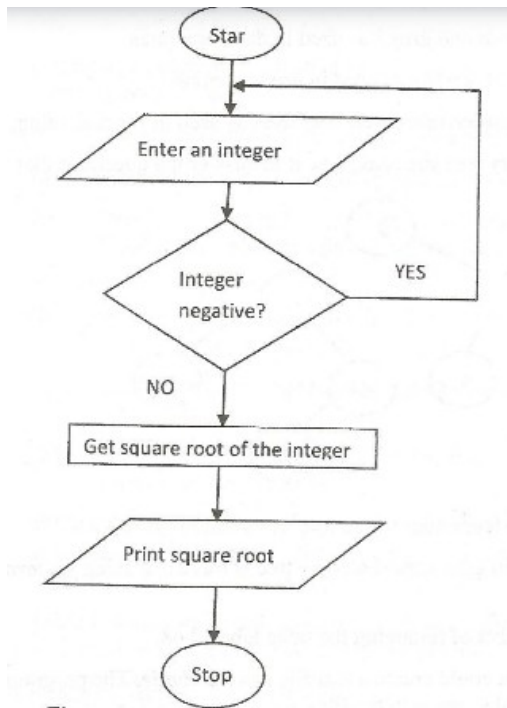
- b) The figure below shows a binary tree structure, use it to answer the questions that follows **(4 Marks)**



- i. Identify all the leaf nodes in the tree
- ii. Show how you would traverse the tree using post-order traversal

Question 4:

- a) The diagram below shows a flow chart used to solve a mathematical problem. Use it to answer the questions that follows



Write a C program to implement the program logic in the flow chart **(6 Marks)**

- b) Below is an array of unsorted data. Show the steps that a bubble sort technique would go through to sort the values in ascending order **(4 Marks)**

68	20	45	53	10	90
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Question 5:

The table shows the criteria used by a certain college to admit applicants to various course levels. Use it to answer the question that follows.

KCSE GRADE	COURSE LEVEL
A OR B	Degree course
C	Diploma Course
D	Certificate course
Any other	Artisan Course

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Write a C program that prompts a user to enter the grade obtained. The program should then output the course level the applicant is qualified to join. Use switch case control structure **(10 Marks)**

Question 6:

- a) The value shown below belong to an array storing students marks for five subjects. Write a C program that would display the values stored in the array **(7**

Marks)

67	78	55	98	49
----	----	----	----	----

- b) Write an algorithm to calculate average of four numbers **(3 Marks)**

THE END