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MAIN EXAMINATION

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MAY – AUGUST 2021

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DEPARTMENT OF COMPUTER AND INFORMATION SCIENCE

REGULAR PROGRAMME

DIT 004: INTRODUCTION TO PROGRAMMING METHODOLOGIES

Date: AUGUST 2021

Duration: 2 Hours

INSTRUCTIONS: 1. SECTION A [Answer 1- Compulsory]

2. SECTION B [Answer 2 Questions]

SECTION A

QUESTION ONE (30 MARKS)

- (a) Describe three (3) levels of programming languages. **[3 Marks]**
- (b) Draw and explain the use of five (5) basic symbols used in drawing program flow charts. **[5 Marks]**
- (c) With the aid of an example in each case, describe three (3) program flow control structures which form the foundation of structured programming. **[6 Marks]**
- (d) Write an algorithm that reads three numbers and prints the value of the largest number. **[5 Marks]**
- (e) Given the C program structure below

- (i) preprocessor directives
- (ii) int main (void)
- (iii){
- (iv)variable declarations;
- (v) statements;
- (vi)return 0;
- (vii) }

Explain the purpose of each of the lines denoted as (i) ---(vi)

[6 Marks]

- (f) Using some code example in each code, explain the circumstances in which you would use while () loop and the do...while() loop.

[5 Marks]

SECTION B

QUESTION TWO (20 MARKS)

- (a) Write a C program that would display the message
“Welcome to DIT 004 - Introduction to Programming Methodologies!” as its output to the screen.

[5 Marks]

- (b) Write a program that may be used to compute the area of a square (area=side²) or area of a triangle (area=base*height/2) after prompting the user to type the first character of the figure name (S for Square or T for Triangle).

[15 Marks]

QUESTION THREE (20 MARKS)

A problem solution can be expressed in either pseudocode or a flowchart.

- (a) Differentiate between a program pseudocode and flowchart.

[4 Marks]

- (b) Given the quadratic equation $ax^2 + bx + c = 0$,

- (i) Write the algorithm in pseudocode to find the roots of the equation.

[Hint:] - Quadratic Formula: $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

[8 Marks]

- (ii) Draw the flowchart for the algorithm above.

[8 Marks]

QUESTION FOUR (20 MARKS)

- (a) Define functions in the context of programming. **[2 Marks]**
- (b) Explain four reasons why functions are needed in programming. **[8 Marks]**
- (c) What is the role played by the following functions in a C program?
(i) scanf()
(ii) printf()
(iii) sqrt(x)
(iv) pow(x,y) **[4 Marks]**
- (d) A general function definition takes the form –
Function_return_type function_name (parameter list){ }
Explain what each of these components stand for.
(i) Function_return_type
(ii) Function_name
(iii) Parameter list **[6 Marks]**

QUESTION FIVE (20 MARKS)

- (a) Identify all the programming errors in the program below.
- ```
/*Program to compute the Mean of three numbers using C language*/

#include<stdio.h>
void main()
{
//Declare three numbers and the mean
 double num1, num2, num3, mean

//input the three numbers
 printf("\n"input the three numbers");
 scanf("%lf",&num1);
 scanf("%lf",&num2)
 scanf("%lf",&num3);

//compute the mean
 mean =num1+num2+num3/3
```

```
//output the mean
printf("\nThe Mean is %lf",Mean);
```

```
return 0;
```

[8 Marks]

- (b) Write a program that will print the **Square, Cube and Square Root** of all Numbers from 1 to N using a for loop.

Hint: Sample output

| No | Square | Cube | Square Root |
|----|--------|------|-------------|
| 1  | 1      | 1    | 1.00        |
| 2  | 4      | 8    | 1.41        |
| 3  | 9      | 27   | 1.73        |
| 4  | 16     | 64   | 2.00        |
| 5  | 25     | 125  | 2.24        |
| 6  | 36     | 216  | 2.45        |
| 7  | 49     | 343  | 2.65        |
| 8  | 64     | 512  | 2.83        |
| 9  | 81     | 729  | 3.00        |
| 10 | 100    | 1000 | 3.16        |

[12 Marks]

DET: MAY 2021

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