

## CRAFT CERTIFICATE IN INFORMATION TECHNOLOGY

### STRUCTURED PROGRAMMING

3 hours

#### SECTION A (40 marks)

Answer ALL questions in this section.

1. Outline four circumstances that would necessitate the development of a program in an

organisation. (4 marks)

2. John compiled a program written using a structured programming language. Outline four

activities that would occur during this process. (4 marks)

3. Describe the type of translator required for each of the following programming languages:

(a) high level language; (2 marks)



(b) assembly language. (2 marks)

4. Explain each of the following terms as used in programming:

(a) scope of a variable; (2 marks)

(b) built-in-function (2 marks)

5. Differentiate between selection and bubble sort techniques as used in programming.

(4 marks)

6. Outline four reasons for the popularity of C programming language.

(4 marks)

7. Write the output generated when each of the following program segment codes in a program



are executed: (4 marks)

(a)

```
int i, j;
```

```
i-7;
```

```
i+-2;
```

```
j= sqrt(i);
```

```
printf ("value of i is %d and j is %d", i, j);
```

(b)

```
int x,y;
```

```
x=5;
```

```
y-abs (6-x*2);
```

```
printf ("value of x is %d and y is %d", x,y);
```



8. Outline four circumstances that may necessitate program maintenance. (4 marks)

9. Jane was tasked with the preparation of documentation for a program she had developed. Outline four factors that she should consider when preparing this document. (4 marks)

10. Outline the purpose of each of the following file function commands as used in C programming

language:

(a) `getw()` (1 mark)

(b) `fprintf()` (1 mark)

(c) `fseek()` (1 mark)



(d) patch() (1mark)

## SECTION B (60 marks)

Answer any FOUR questions in this section.

11. (a) Explain the term dry running as used in programming. (2 marks)

(b) Describe each of the following type of program testing:

(i) unit (2 marks)

(ii) system. (2 marks)

(C) Figure I shows a binary tree drawn by a student during a lesson. Use it to answer the



questions that follow.

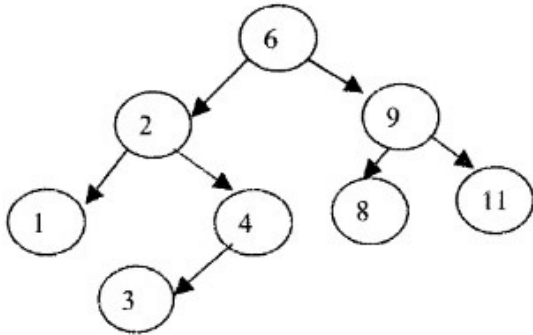


Figure 1

(i) State the relationship that exists in each of the following nodes:

(I) node 2 and node 9 with respect to node 6;  
(1mark)

(II) node 3 with respect to node 6, node 2 and node 4; (1 mark)

(III) node 8 with respect to the whole tree structure.  
( 1mark)



(ii) Write the output generated when the tree is traversed using the *preorder* strategy. (2 marks)

(d) Write a C program that would prompt a user to enter two numbers then output the greater of the two numbers. (4 marks)

12. (a) Outline three challenges of using `scanf()` to capture data in C programming language. (3marks)

(b) Differentiate between *dynamic* and *static* array data structures. (4 marks)

(c) Write a C program that prompts a user to enter a character. The program then displays a

message "*It is a vowel*" if the character entered is a vowel, otherwise "*Not a vowel*".

Use switch statement. (5 marks)



(d) John opted to use pointers when creating a data structure. Outline three benefits of this approach. (3 marks)

13 (a) Outline two reasons of closing a file as soon as the file operations are done. (2 marks)

(b) Explain the use of a default statement in control structures. (2 marks)

(c) Write a C program that prompts a user to enter a number. The program then computes and displays the cube of the number through the use of a function. (5 marks)

(d) Write a C program that would prompt a user to enter 10 numeric values into an array.

The program then computes the average of the values and displays the result. (6 marks)





14. (a) Outline four merits of using flowcharts during program design. (4 marks)

(b). Write a C programming language segment code that assigns a numeric value 16 to an integer variable  $x$  through a pointer named  $pri$ . (3 marks)

(c) The following is a segment code in a C program.

```
for (i=0; i<2; i++)  
for (j=0; j<3; j++)  
{  
scanf ("%f", &A[ i ][ j ]  
}
```

Interpret the code. (3 marks)



(d) Write a C program that prompts a user to enter distance in meters. The program then converts the distance into kilometres and displays the results. (5 marks)

15. (a) Outline four reasons for preparing documentation in all the stages of program development. (4 marks)

(b) Ann, a programmer detected a logical error in a program. State two characteristics that the program exhibited for this conclusion. (2 marks)

(c) Differentiate between *user manual* and *technical manual* as used in programming (4 marks)



(d) Figure 2 shows a flowchart used to solve a particular problem. Use it to answer the question that follows. (5 marks)

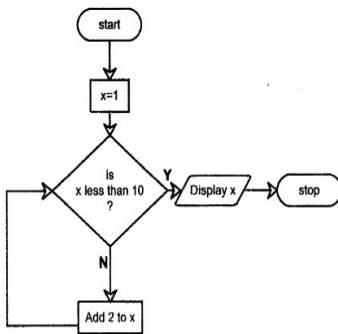


Figure 2

Write a C program to implement the logic represented in figure 2.

