



kasneb

CICT PART II SECTION 3
STRUCTURED PROGRAMMING

THURSDAY: 23 May 2019.

Time Allowed: 3 hours.

Answer ALL questions. Marks allocated to each question are shown at the end of the question.

ALL programs written should be in C programming language.

QUESTION ONE

- (a) (i) Explain the term “integrated development environment (IDE)” as used in structured programming. (2 marks)
- (ii) Highlight four tools provided by C programming integrated development environment. (4 marks)
- (b) Distinguish between each of the following terms as used in C programming:
- (i) “Pair programming” and “code review”. (4 marks)
- (ii) “Recursive function” and “non-recursive function”. (4 marks)
- (c) (i) Describe the terminology “token” as used in structured programming. (2 marks)
- (ii) Citing an example in each case, explain two types of tokens used in C programming. (4 marks)

(Total: 20 marks)

QUESTION TWO

- (a) (i) Explain the C programming feature shown by the code segment below:
- ```
int Sum () {
 Sum (); }
 (2 marks)
```
- (ii) Critique the feature in (a) (i) above. (2 marks)
- (iii) Explain an alternative way of implementing (a) (i) above in C programming. (2 marks)
- (b) (i) Distinguish between “signed” and “unsigned” integers. (2 marks)
- (ii) Explain a situation when each of the integers mentioned in (b) (i) above could be used in programming. (4 marks)

- (c) Rewrite the following program using the ternary operator:

```
#include <stdio.h>
int main () {
 int marks ;
 printf (“Enter marks Scored”);
 scanf (“%d”, &marks);
 if(marks >= 50) {
 printf (“passed”);
 }
 else {
 printf (“failed”);
 }
}
```

(4 marks)

- (d) Differentiate between “const char \*p” and “char const \*p” as used in C programming. (4 marks)

(Total: 20 marks)

### QUESTION THREE

(a) Study the program extract given below:

```
Struct Student {
 char fname [25];
 char lname [20];
 int id;
 float fee;
}
```

**Required:**

(i) Create an instance of student named Std1 (2 marks)

(ii) Assign the following data members to Std1 as follows:

|       |            |
|-------|------------|
| fname | “TONNY”    |
| Lname | “Omwami”   |
| Idno  | “29304762” |
| Fee   | “40,000”   |

(2 marks)

(b) Highlight four main challenges in mobile application development. (4 marks)

(c) There are times when it is necessary to have a pointer that does not point to anything.

**Required:**

State three ways of using a null pointer in C language. (3 marks)

(d) In boxing, the weight class of a boxer is decided as per the following table:

| Boxer class   | Weight in Kilogrammes |
|---------------|-----------------------|
| Flyweight     | < 115                 |
| Bantamweight  | 115 - 125             |
| Featherweight | 125 - 153             |
| Middleweight  | 154 - 189             |
| Heavyweight   | > = 190               |

**Required:**

Write a program in C language that receives weight as input and prints out the boxer's weight class. (9 marks)

(Total: 20 marks)

### QUESTION FOUR

(a) Using a single line of code snippet, illustrate how to perform the following file operations:

(i) Creating a new file. (2 marks)

(ii) Opening an existing file. (2 marks)

(iii) Closing a file. (2 marks)

(b) Write a C program that prompts a user to enter an integer then check whether the given input integer is negative, zero or positive. (6 marks)

(c) Describe the following as used in structured programming:

(i) Script programming. (2 marks)

(ii) Logic programming. (2 marks)

(d) Distinguish between “algorithm” and “flowchart” as used in structured programming. (4 marks)

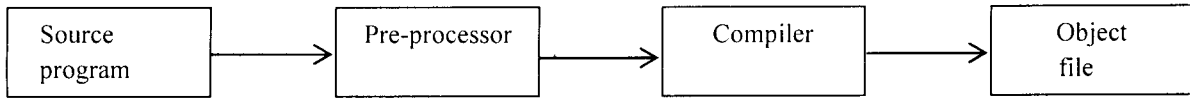
(Total: 20 marks)

**QUESTION FIVE**

(a) Using an example in each case, explain the following terms as used in structured programming:

- (i) Coercion. (3 marks)
- (ii) Identifier. (3 marks)

(b) The figure below shows the compilation process of a program:



**Required:**

- (i) Define object file. (1 mark)
  - (ii) Outline three tasks of a pre-processor. (3 marks)
  - (iii) Highlight three advantages of using a compiler. (3 marks)
- (c) Study the program extract below built to reverse a String:

```
include <stdlib.h>
include <string.h>
char reverse (char input) {
 int length = strlen (input);
 char output [length];
 for (int i = 0; i < length; i++) {
 output [length - i - 1] = input [i];
 }
 return output;
}
main () {
 char name [20];
 printf ("Enter your name: ");
 scanf ("%d", name);
 printf ("Reverse name %d", reverse (name));
}
```

**Required:**

Rewrite the above program code without errors.

(7 marks)  
**(Total: 20 marks)**

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