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 - 121
Featherweight	122 - 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)

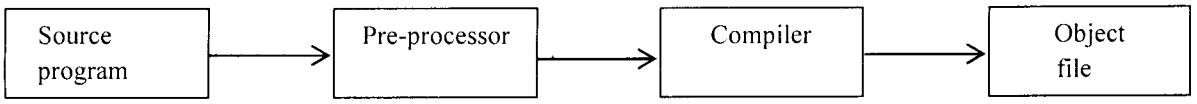
QUESTION FIVE

(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 [ k ] ;
       }
        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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