kasneb

CICT PART II SECTION 3

STRUCTURED PROGRAMMING

THURSDAY: 20 May 2021.   **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)   Distinguish between a "function" and a "procedure" as used in structured programming.   (4 marks)

(b)   Show the syntax for the following function related aspects in C:

      (i)   Function definition.   (1 mark)

      (ii)   Function call.   (1 mark)

      (iii)   Function declaration.   (1 mark)

(c)   Draw a loop flowchart.   (4 marks)

(d)   Describe the following terms as used in program module development:

      (i)   Testing.   (2 marks)

      (ii)   Debugging.   (2 marks)

(e)   Below is a book structure defined in C:

```
struct.Books{
        char title[50];
        char author [50];
        char subject[100];
        int book-id;
}book;
```

Demonstrate how to declare a variable of type Books and how to initialise its details (use any appropriate initial values).   (3 marks)

(f)   Describe the purpose of namespace in the content of programming.   (2 marks)
                                                                                        (Total: 20 marks)
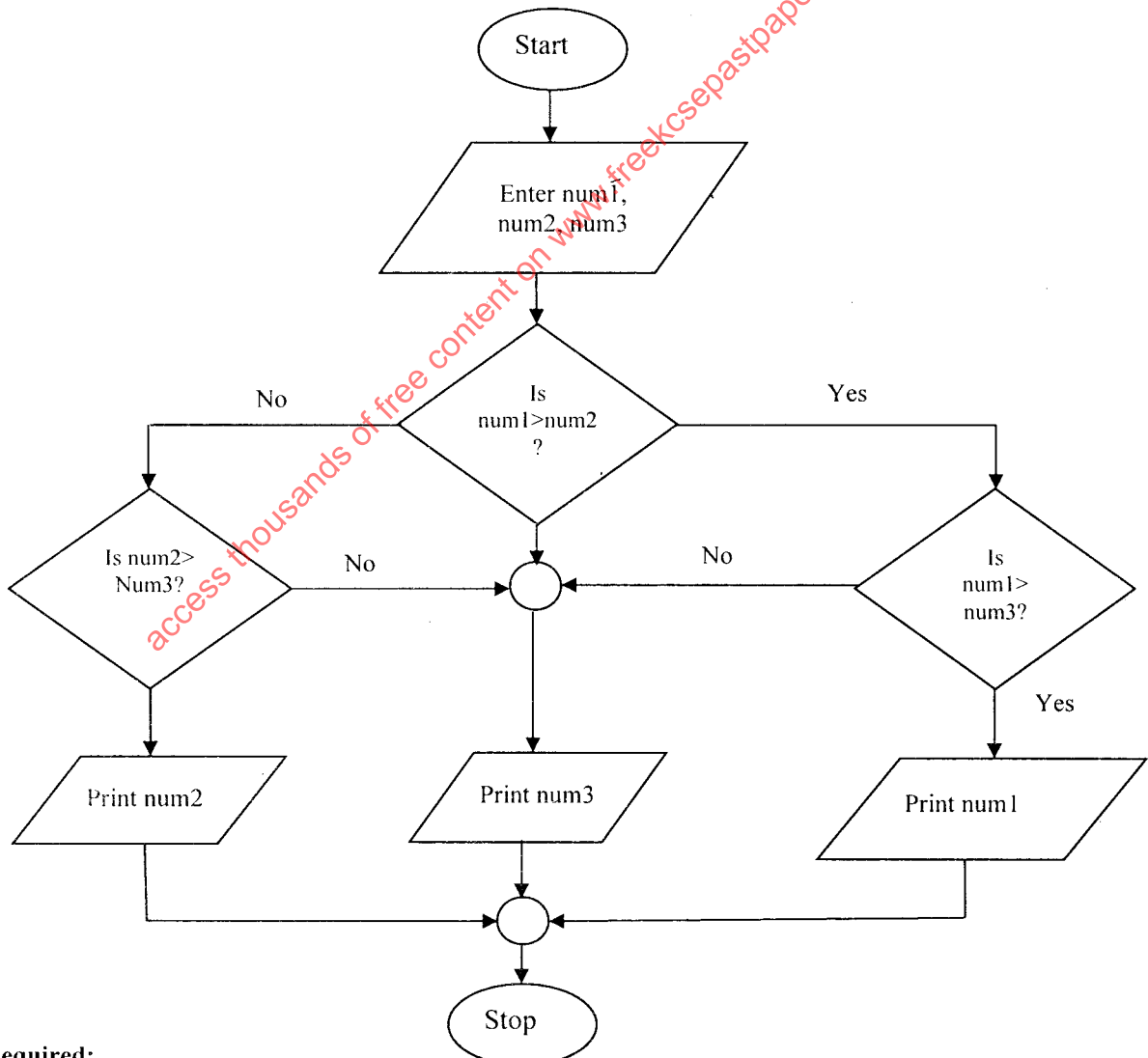
QUESTION TWO

(a)   Describe the function of stdio.h header file in C.   (2 marks)

(b)   Define a scripting language.   (2 marks)

(c)   List three features of an integrated development environment (IDE).   (3 marks)

(d)   Explain three main categories of control structures.   (6 marks)

(e)   Write a switch case program that uses the table below to output comments based on a read grade:

Grade	Comments
A	Excellent
B	Very Good
C	Good
D	Average
E	Below Average

(7 marks)
(Total: 20 marks)

QUESTION THREE

(a)   Explain each of the following forms of program testing:

    (i)   Unit.   (2 marks)
    (ii)   System.   (2 marks)

(b)   Describe each of the following types of program documentation:

    (i)   Known bugs manual.   (2 marks)
    (ii)   Technical documentation.   (2 marks)
    (iii)   Requirements documentation.   (2 marks)

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

(d)   The flowchart below was designed by a student in a programming class:

Required:
Write a C program that would be used to implement the program logic.   (6 marks)
(Total: 20 marks)

QUESTION FOUR

(a)   The C program extract below was written by college students.

```
#include<stdio.h>
main ( )
{
        FILE *fp;
        (x);
        (y);
        (z);
}
```

Required:

Write expressions in C language for the lines labelled x, y and z as follows:

(i)   x – An expression for opening a text file named exam for reading, writing and overwriting any existing data.   (2 marks)

(ii)   y – An expression to output a string "CICT examination" in exam file.   (2 marks)

(iii)   z – An expression to close the exam file.   (2 marks)

(b)   (i)   Outline three return types obtained from the scanf ( ) library function.   (3 marks)

        (ii)   Highlight two ways to make a pass by reference parameter in C programming language.   (4 marks)

(c)   Write a C program that prompts a user to input a year. The program then determines whether the year is leap or not and displays an appropriate message.

        Use a function in your program.   (7 marks)
                                                                                                      (Total: 20 marks)

QUESTION FIVE

(a)   Explain the following file operating modes in C language:

        (i)   wb.   (1 mark)

        (ii)   w+.   (1 mark)

        (iii)   a+.   (1 mark)

(b)   (i)   Explain the meaning of an identifier as used in programming.   (2 marks)

        (ii)   List three rules observed when coming up with an identifier.   (3 marks)

(c)   (i)   Write a C function that takes an array consisting of identification number (ID) elements as an argument and its length. The function then returns the largest element and its index as an array.   (7 marks)

        (ii)   Write a C program that assigns values (2, 4, 2, 6, 8, 10, 11, 20) to an array. The program should then call the function in (c) (i) above, pass the array, then display the largest number and its index. (5 marks)
                                                                                                      (Total: 20 marks)

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