

KASNEB

CICT PART II SECTION 3

STRUCTURED PROGRAMMING

THURSDAY: 26 November 2015.

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) Highlight two advantages of high level languages. (2 marks)
- (b) Giving an example in each case, differentiate between a “syntax error” and a “logical error” as used in structured programming. (4 marks)
- (c) Write a C language program that prompts a user to input two numbers, divide their product by 2 and then display the result. (6 marks)
- (d) Identify three places where variables could be declared in C programming language. (3 marks)
- (e) Study the program segment given below:

```
for (i = 1; i <= 10; i++)
{
    if (i == 6)
    {
        break;
    }
    Printf(“%d”, i);
}
```

Required:

Determine:

- (i) The function of the keyword “break” that appears within the for.....loop. (2 marks)
- (ii) The output of the program segment. (3 marks)

(Total: 20 marks)

QUESTION TWO

- (a) Outline three types of operators used in C programming language. (3 marks)
- (b) Explain the following functions as used in C programming language:
- (i) Malloc (. (2 marks)
- (ii) Sizeof (. (2 marks)
- (iii) Rand (. (2 marks)
- (c) Differentiate between the following terms in relation to structured programming:
- (i) “Source code” and “object code”. (4 marks)
- (ii) “Testing” and “debugging”. (4 marks)
- (d) Using a suitable declaration, describe the use of linked lists in C programming. (3 marks)

(Total: 20 marks)

QUESTION THREE

(a) Citing an example in each case, explain the purpose of the following directives as used in C programming:

(i) #include. (3 marks)

(ii) #define. (3 marks)

(b) Distinguish between "homogenous" and "heterogenous" arrays. (4 marks)

(c) Study the C program extract given below:

```
/*program in C language */  
  
#include<stdio.h>  
  
Main ( )  
{  
int i = 0, x = 0;  
while (i < 20) {  
if (i % 5 == 0) {  
x += i;  
printf("%d", x);  
}  
++i;  
}  
Printf("\nx = %d", x);  
}
```

Required:

(i) Identify unexecutable code in the above extract. (2 marks)

(ii) Explain why ++i executes faster than i+1 in the above program. (2 marks)

(iii) Write the output of the program. (6 marks)

(Total: 20 marks)

QUESTION FOUR

(a) Using an example, describe a user defined type declaration. (4 marks)

(b) Using program statements distinguish between "symbolic" and "literal" constants as used in structured programming. (4 marks)

(c) ABC Academy wishes to keep 100 records of its students. Construct a typical structure declaration called studentDetails that would be used to capture the records. The structure should have members' fname; idno and feePaid. (4 marks)

(d) A computer lecturer created a file named "C:/marks.txt" for storing a student's number (integer), student's name (a string) and the mark obtained by the student in an examination (float).

Required:

Write a C program to perform the following tasks:

(i) Open the file for writing into. (1 mark)

(ii) Write the following record: 1, "Peterson", 65.0 (1 mark)

(iii) Open the file, read and display all records from the file. (6 marks)

(Total: 20 marks)

QUESTION FIVE

- (a) Highlight four qualities of a good technical manual. (4 marks)
- (b) Outline four challenges facing mobile application development. (4 marks)

(c) Write a C language program to display the following output:

1

1 2

1 2 3

1 2 3 4

1 2 3 4 5

(6 marks)

(d) The C program below checks whether a number is negative, positive or zero using nested if.....else statement:

```
#include<stdio.h>
int main ( );
{
    float num;
    printf("Enter a number:");
    scanf("%f",&num);
    if (num<0) /*check whether num is less than 0
        printf("%.2f is negative.", num);
    else if (num>0)
        printf("%.2f is positive.", num);
    else
        printf("you entered zero.");
    return 0;
}
```

Required:

- (i) Explain the function of %.2f as used in the program. (2 marks)
- (ii) Identify four errors that the program will encounter during debugging. (4 marks)

(Total: 20 marks)

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