**No of Pages : 3** **Course Code : 18MX13**

Roll No:
(To be filled in by the candidate)

**PSG COLLEGE OF TECHNOLOGY, COIMBATORE - 641 004**

**SEMESTER EXAMINATIONS, JANUARY 2020**

**MCA Semester: 1**

**18MX13 STRUCTURED PROGRAMMING CONCEPTS**

**Time : 3 Hours** **Maximum Marks : 100**

**INSTRUCTIONS:**

1. Answer **ALL** questions. Each question carries 25 Marks.
2. Subdivision (a) carries 3 marks each, subdivision (b) carries 10 marks each and subdivision (c) carries 12 marks each.
3. Course Outcome Table :

| Qn.1 | CO1 | Qn.2 | CO2. | Qn.3 | CO 3 | Qn.4 | CO.4 |
|---|---|---|---|---|---|---|---|

1. a) Compare and contrast Top-Down approach and Bottom-Up Approach for structured programming?
   b) Discuss when to use and when not to use “C” programming language for applications development.
   c) Compare and Contrast properties of Programming language with respect to programmer and Language developer with illustrations from ‘C’ language.
2. a) Distinguish Iteration from Recursion with an example.
   b) Compare and contrast the following programming language constructs:
      i. Expressions and Statements
      ii. printf () and scanf ()
   c) i) A number is Armstrong number if the sum of its digits raised to the third power is equal to the number itself. For example, 371 is an Armstrong number, since $3^3 + 7^3 + 1^3 = 371$. In the following program user is supposed to enter a limit and the program prints all the Armstrong numbers from 1 to the user specified limit. Complete the program.

```
#include <stdio.h>
int main()
 { int number=1, originalNumber, indicator, result = 0, limit;
 printf("Enter the limit: "); /* Read the limit from the user*/
scanf("%d", &limit);
 while(_____)
  {   /* Loop for updating the result */
       originalNumber = number;
       result = 0;
while (_____)
      {  indicator = _____;
        result +=_____;
      originalNumber = _____;
    }
       if(_____)
              printf("%d is an Armstrong number.",number);
   _____;
}
 return 0;
 }
```

[OR]

ii) It is required to read a character string containing only upper-case alphabetic characters and blank spaces from the keyboard. Then, for a given value of an integer k, every alphabetic character is replaced by the k-th next alphabetic character. It is assumed that in counting the k-th next alphabet, the letter 'A' comes after 'Z'. For example, with the value of k as 3, the string "HAPPY BIRTHDAY TO YOU" will be replaced by "KDSSB ELUWKGDB WR BRX. Write a C program to do the above task.

3. a) What is the output of the following program?

```
main()
 {  int array[10] = { 20, 18, 16, 14, 12, 10, 8, 6, 4, 2 };
    int *ptr;
    ptr = array;
    printf("%d,%d", *ptr + 2, *(ptr + 2));
 }
```

b) i. In this C declaration "long *(*(*(*z)(void))[7])(void); ", What is z? Give syntax for the use of 'z'. [3]

ii. With a suitable application distinguish the following [3+4]

1. Pointers and Arrays
2. Arrays and Structures

c) i. Discuss the following aspects of structured programming with illustrations from C and compare the various alternatives

1. Storage Classes [5]
2. File handling functions and applications of file in C [7]

[OR]

ii. See the code below for function changeArr() that takes as argument an integer array (a) and number of elements (n) in the array. The function changes the array as follows -- every positive even element is increased by 1, every positive odd element is decreased by 1, and zero or negative elements are left unchanged. The function uses one pointer variable (p) to access the array elements. Fill in the blanks in the code, so that the function operates correctly.

```
# void changeArr (int *a, int n) {
    int *p; p = a;
    While( _____ ) {
   if ( _____ )
      { // positive even element – increase by 1
        -------  ++ ; }
else if ( _____ )
{ // positive odd element – decrease by 1
 _____ - - ;
}
 _____ ; // increment for next iteration
} // end while
}
```

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4. a) What is the role of Scripting languages in Web Client and Server side applications development?

   b) Compare and Contrast System programming languages and Script languages in detail

   c) Explain the following features of C language with real-life applications.

      i. User defined library functions with header files

      ii. Graphics programming.

**/END/**

**FD/RL**