No of Pages : 2 **Course Code : 18MX13**

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

PSG COLLEGE OF TECHNOLOGY, COIMBATORE - 641 004

SEMESTER EXAMINATIONS, JANUARY 2019

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	CO 1	Qn.2	CO 2	Qn.3	CO3	Qn.4	CO 4

1. a) What is structured programming? Give any features and approaches for structured programming.

   b) Discuss the any five criteria for programming language classification and classify "C" programming language based on mentioned criteria.

   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 [4]

      ii. Entry Control and Exit Control iterative structures [6]

   c) i) The following program is supposed to insert a new integer value x into an already sorted (in ascending order) array A containing n distinct integers. You can assume that x does not already exist in A, and there is space available to insert x in A. For example, assume that n is 10, and A has the elements 10, 20, 30, 40, 60, 70, 80, 90, 100, 110, and x is 56. After insertion of x, the array would become 10, 20, 30, 40, 56, 60, 70, 80, 90, 100, 110, and n would be 11. Fill up the missing lines in the program so that the program inserts x in the sorted array A.

```
#include <stdio.h>

int main()
{
  int x, i = 0, j, n, A[100];
  scanf("%d%d", &n, &x);
  for (j = 0; j < n; j++)
       scanf("%d", &A[j]);
 while (_____________)
   i++; /* find position after which to insert */
 for (_____;_________; j--) /* make space for inserting x */
    A[j] = ----------;
  n++;
  -------- = x; /* insert the element at the required place */
 for (i = 0; i < n; i++)
   printf("%d ", A[i]);
  return  _______;
}
```

[OR]

ii. Write a C program to accept a two dimensional array of integers as input, rotate 90 degree clock-wise and also rotate 90 degree anti-clock-wise without using extra memory. Print the matrix before and after the rotations.

3. a) What are the outputs of this code?

```
struct _st {
  int x,y;
  struct _st *lnk1,*lnk2;
  }  a,b,c, *p;

  a.x=b.y=10;    a.y=b.x=15;
  c.x=a.x+b.x;   c.y=a.x+b.y;
  a.lnk1=&b; b.lnk1=&c; a.lnk2=&c; b.lnk2=&a;
  c.lnk1=c.lnk2=NULL;  p=&b;
  printf("val1=%d  val2=%d \n",p->lnk1->x,p->lnk2->y);
  printf("val3=%d val4=%d \n",p->lnk2->lnk1->x, p->lnk2->lnk1->y);
```

b) i. In this C declaration "**long *(*(*(*z)(void))[7])(void);** ", What is z? Give an application for Z. [3]

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

1. Void Pointer and Null pointer

2. Array and Structure

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

1. Call by Value and Call by Reference [4]

2. Storage Classes [5]

3. Parameters, place and role of main ( ) function. [3]

[OR]

ii) Write a function to find the longest substring which is also palindrome from the given input string.

For example, if the given string is "forgeeksskeegfor",

the output should be "geeksskeeg".

Use pointers, pointer arithmetic operations and dynamic memory for storing the string. Write the caller function for this function.

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 details.

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

i) Role of Scripting and Markup languages for Web programming.

ii) Multi –threaded programming and Graphics programming.

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FD/RL