

**MASTER'S IN MATHEMATICS WITH
APPLICATIONS IN COMPUTER SCIENCE
M.Sc. (MACS)**

**Term-End Examination
December, 2012**

**MMT-001 : PROGRAMMING AND DATA
STRUCTURES**

Time : 1½ hours

Maximum Marks : 25

Weightage : 20%

Note : Question No. 1 is compulsory. Answer any three questions from question 2 to 5. All programs should be written in 'C' language. Use of calculator is not allowed.

1. Write the output of the following pieces of code in 'C' language. Justify your answer with brief explanation. 10

- (a) `int **ip, i=5, *ip1=&i ;`
`ip=&ip1 ;`
`printf ("%d\n", **ip + *ip1) ;`
- (b) `char* t="THIS TEST" ;`
`int i=0 ;`
`while (t [i++]) {`
`printf ("%c", t [i]) ;`
`}`

```
(c)  int x=2, y=3, z1, z2, r=0 ;
      z1=(z2=x<y?x : y)==x?x : y ;
      for (; z1>=0 ; z1--)
      r + = z1;
      printf ("%d", r) ;
```

```
(d)  S () {
      static int x=0 ;
      x + =1 ;
      printf ("x=%d\n", x) ;
    }
    main () {
      int i ;
      for (i=1 ; i<5 ; i++)
        S () ;
      return 0 ;
    }
```

```
(e)  int a=0, n=1969 ;
      while (n>0) {
        a+=n%10 ;
        n/=10 ;
      }
      printf ("%d", a) ;
```

2. Write a program in 'C' to compute the sum upto n^{th} term of $\sin(x)$ series. 5

3. (a) The inorder and preorder tree traversals for a binary tree are given below : 3

```
        6    7    8    9    10   11   12
and    10   7    6    9    8    12   11
construct the binary tree.
```

- (b) Write C printf statements for printing the number 573.423 using. 2
- (i) 8 place right justified.
 - (ii) 8 place left justified with only two decimal digits.
4. The login names and passwords of some users are stored in a linked list of which a node is defined below : 5
- Struct User**
- ```

{ char login_name[20];
 char password[15];
 struct user *Next;
};

```
- typedef struct user USER ;**
- Write a function that takes as input two strings S1 and S2 and a pointer of type USER and returns.
- (a) The string "USER NOT FOUND" if the string S1 doesn't exist in the list.
  - (b) The string "PASSWORD INCORRECT" if the string S1 exists in the list but S2 doesn't exist in the list.
  - (c) The string "SUCCESS" if both the strings S1 and S2 exist in the list.
5. Explain in brief the following :
- (a) Call by value and call by reference with an example. 2
  - (b) Enumerator data type with example. 2
  - (c) L-value and R-value. 1
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