No. of Printed Pages : 4

MMT-001

M.Sc. (MATHEMATICS WITH APPLICATIONS IN COMPUTER SCIENCE)

M.Sc. (MACS)

Term-End Examination

06041

December, 2017

MMT-001 : PROGRAMMING AND DATA STRUCTURES

Time : $1\frac{1}{2}$ hours *Maximum Marks : 25*

(Weightage : 20%)

Note : *Question no. **5** is **compulsory**. Answer any **three** questions from questions no. 1 to 4. All programs should be written in 'C' language. Use of calculator is **not** permitted.*

1. (a) Explain the difference between pre-increment and post-increment operators with the help of an example. *3*

(b) Write a C function to interchange any two rows of a two-dimensional array of floating point numbers. *2*

2. (a) Write a function in C which takes a list of numbers as input and returns the frequency of each number in the list. *3*

(b) Write C printf statements for printing the number 573·423 using

(i) 8 places right justified,

(ii) 8 places left justified with only two decimal digits. *2*

3. (a) What do 'call by value' and 'call by reference' mean ? Explain each of them with an example. *2*

(b) Write a function to compute the sum of the first n terms of cos(x) series. *3*

4. (a) Define a node for a singly linked list of integers using pointer implementation. Also write a function that adds a new node to the list. *3*

(b) What are the values of the following expressions ?

(i) 3 / (float)5

(ii) (int) (3 / 5·0)

Justify your answer. *2*

5. Write the output of the following. Justify your answer. *5×2=10*

(a)
```
main() {
    int x = 10, y = 11, a = 5, b = 6;
    x = x++;
    y = x;
    a = - - a;
    b = a++;
    printf("%d %d\n", x, y);
    printf("%d %d\n", a, b);
}
```

(b)
```
main() {int i;
   for (i = 1; i <=3; i++)
   stat() ;
}
stat() {
   static int x = 0;
   x = x + 1;
   printf ("x = %d\n", x);
}
```

(c)
```
main() {
   int a, b;
   for (a = 90; a > 87; a - - ){
      for (b = a; b > 87; b - - )
      printf ("%d", b); printf ("\n");}
}
```

(d)
```
push(A);
push(B);
pop();
push(C);
pop();
pop();
push(x);
printf ("%C", pop());
```

(e) List the inorder traversal of the following Binary tree :