Computer Science & Engineering Department Indian Institute of Technology Kharagpur

CS10001 Programming and Data Structures Class Test I

Duration: 1 hrs	Total Marks: 20
Name:	
Roll No:	
Section:	

Question 1 (5)	2 (2)	3 (2)	4 (3)	5 (3)	6 (5)	Total (20)

1. For questions 1.1 to 1.5 assume that variables *a* and *b* have data type *int* and variable *c* and *d* have data type *float*. Also, a = 9, b = 8, c = 16.0, and d = 6.0. For each question write the value assigned to the variable *z*. Data type of *z* is *float*. [5 X 1]

1.1.
$$z = a + c/4 * d/3 + b;$$

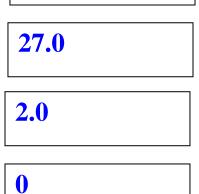
25.0

1.2. z = c + a/4 * b/3 + d;

1.3. z = (int) c / a * b / 3;

1.4. z = a/b * b % 5 % 3;

1.5. $z = (a \ge c)?a : c;$



16.0

2. Write the output of the following program in the box below

```
int main() {
    char x = 'w';
    switch(x)
     {
          case 'a': printf("Append");
                    break;
          case 'w': printf("Write");
          case 'r': printf("Read");
                    break;
         default : printf("Open");
                    break;
     }
    return 0;
```

WriteRead

}

3. Write the output of the following program in the box below.

```
[2]
```

```
int main() {
     int a = 5;
    b = f (a);
    printf ( "%d %d ", a, b );
    return 0;
}
int f ( int a ) {
    a++ ;
    printf ("%d ", a);
    return a ;
}
```

656

```
4. The following program should print the sum of the series
       1 + x^2/2! + x^4/4! + \dots + x^{2N}/2N!
Fill in the blanks in the program.
                                                                          [3]
  int main() {
     int i, N ;
     float x<u>, S, term;</u>
               0
     S
           =
                                    ;
     term =
                                    ;
     printf ( "Enter N and x" ) ;
     scanf("%d %f", &N, &x);
     for (i = 1; i <= N+1; i++) {
           S = S + term;
                    term*x*x/(2*i* (2*i -1))
           term =
                                                                            ;
      }
     printf ("The sum of the series is %f ",S) ;
  }
```

5. The following program prints the most significant digit of an integer *n*. Fill in the blanks with only one statement per blank space. [3]

Roll No:

6. Write a C program which reads a sequence of positive integers till the user types -1. It counts the lengths of the non-decreasing subsequences, and prints the maximum among them. For example, for input $\{6, 7, 2, 29, 17, 5, 5, 11, 6, 7, 8, -1\}$ the non-decreasing subsequences are: $\{6, 7\}, \{2, 29\}, \{17\}, \{2, 29\}, \{2,$ $\{5, 5, 11\}$ and $\{6, 7, 8\}$. Thus the answer should be 3.

Assume that the first integer read is not -1 and a single integer is a sequence of length 1

```
int main (){
     int prevno, curno, curlength, maxlength;
     curlength = 1; maxlength = 0;
     scanf ("%d", &prevno) ;
     scanf ("%d", &curno);
     while (curno != -1) {
         if (curno >= prevno)
             curlength++;
         else {
             if (curlength > maxlength) {
                  maxlength = curlength;
             curlength = 1;
          prevno = curno :
          scanf ("%d", &curno);
     if (curlength > maxlength)
         maxlength = curlength;
     printf ("Maximum length is %d\n", maxlength);
     return 0;
```

[5]

Roll No:

Rough Sheet