Indian Institute of Technology, Kharagpur

Department of Computer Science and Engineering

Class Test 1, Spring 2017-18

Programming and Data Structure (CS 11001 / CS 10001)

Students: **Date**: 31-Jan-2018

Full marks: 20 **Time**: 7:00pm–8:00pm

Answer the questions in the spaces provided on the question sheets. You may use the last page of this booklet for your rough work. No other supplementary sheets will be given to you.

Roll Number		Section	
Name			

Question:	1	2	3	4	5	Total
Points:	5	5	5	2	3	20
Score:						

1. (5 points) Fill in the blanks below. One blank can have ATMOST ONE statement.
   [2+1.5+0.5+0.5+0.5=5]

```
/* C program to calculate compound interest */
#include<stdio.h>
#include<math.h>
int main() {
    float principal, rate, time, amount, interest;
    /*  Take principal, rate and time as input from user */
    printf("Enter Principal\n");
    scanf("%f", &principal);
    printf("Enter Rate of Interest\n");
    scanf("%f", &rate);
    printf("Enter Time in Years\n");
    scanf("%f", &time);

    /* Calculates Total Amount after time years  */
    amount = principal * _____pow((1 + rate/100), time)_____;
    /* Calculates Compound Interest accrued in time years  */
    interest = ____amount - principal_____;
    printf("After ____%f_____ Years\n", ____time_____);
    printf("Total Amount = ___%f______\n", __amount___);
    printf("Compound Interest Earned = __%f___", ___interest___);

    return 0;
```

```
}
```

2. (5 points) What will be the output of the following programs? [3+2=5]

(a)

```
#include<stdio.h>
int main()
{
   float x = 7.52, y = 7.25;
   if (x = y) printf("EQUAL\n");
   else printf("INEQUAL\n");
   if (x == y) printf("EQUAL\n");
   else printf("INEQUAL\n");
   return 0;
}
```

Answer: EQUAL
EQUAL

(b)

```
#include <stdio.h>
int main()
{
   char choice = 'c';
   switch(choice)
   {
      default: printf("30\n");
      case 'a': printf("10\n");
      case 'b': printf("20\n");
   }
   return 0;
}
```

Answer: 30
10
20
(Marking Scheme: give 1-mark if only outputs 30, give 2-marks if the output matches exactly; otherwise give 0. Give marks even if all outputs are in same line.)

3. (5 points) Consider the following programs. Write the values of count, sum and n at the end of these programs? [3+2 = 5]

(a)

```
#include <stdio.h>
int main()
{
    int n = 10, count = 0, sum = 0;
    while(n-- > 0)
    {
        n /= 2;
        count++;
        sum +=n;
    }
    return 0;
}
```

Count: 3

Sum: 5

n: -1
Marking scheme: 1 mark for each

(b)

```
#include <stdio.h>
int main()
{
    int n = 10, count = 0, sum = 0;
    while(--n > 0)
    {
        n /= 2;
        count++;
        sum +=n;
    }
    return 0;
}
```

Count: 2

Sum: 5

n: 0
Marking scheme: 2 marks if all three correct, 1 mark if one of these is incorrect, otherwise 0.

4. (2 points) What will be the output of the following programs? [1+1 = 2]

(a)

```
#include <stdio.h>
int main()
{
    int count = 0;
    for(;;)
    {
        if(count==10)
            break;
        printf("%d ",++count);
    }
    return 0;
}
```

Answer: 1 2 3 4 5 6 7 8 9 10

(b)

```
#include <stdio.h>
int main()
{
    int num;
    for(num=0;num<10;++num)
    {
        printf("#");
        if(num>6)
            continue;
        printf("%d",num);
    }
return 0;
}
```

Answer:
#0#1#2#3#4#5#6###

5. (3 points) Fill in the blanks. The following code snippet is from a program that takes as input a stream of integers until the number 0 is entered. It then prints the total number of even (zero excluded) and odd integers that were input.

```
#include<stdio.h>
int main()
{
    int odd_count=0, even_count=0, num;
    printf("\n Enter integers (input 0 to terminate):");
    scanf("%d", &num);
```

```
    while(___num != 0__________)
    {
        if(___num%2 == 0________)
            even_count++;
        else
            odd_count++;

        __scanf("%d", &num)_____;
    }
    printf("\n The number of even numbers entered is %d.", even_count);
    printf("\n The number of odd numbers entered is %d.", odd_count);
    return 0;
}
```

[Extra space for rough work]