Name:

IIT Kanpur
ESC101 Fundam. of Comp.
NAME OF EXAMINATION
Date: January 16, 2018

Roll No:
e.g. 17001

Dept.:
e.g. CHE

Sect.:
e.g. A4

Instructions:

Total: **010 marks**

1. This question paper contains a total of 6 pages (6 sides of paper). Please verify.
2. Write your name, roll number, department on **every side of every sheet** of this booklet.
3. Write final answers **neatly with a pen**. Pencil marks can get smudged and you may lose credit.
4. Do not give derivations/elaborate steps unless the question specifically asks you to provide these.

Problem 1 (Ultra Short Answer: 5 marks). Give your answers in the space provided only.

1. In the space given, write down the output of the program given below.

```c
#include<stdio.h>
int value;
void recurse(int array[], int sz){
   if(sz == 1)
      return;
   array[sz/2] = value;
   value++;
   recurse(array, sz/2);
   recurse(array + sz/2, sz/2);
}
int main() {
   value = 0;
   int sz = 5;
   int array[5];
   for (int i = 0; i < sz; ++i)
   {
      array[i] = 200+i;
   }
   recurse(array, sz);
   for (int i = 0; i < sz; ++i)
   {
      printf("%d\n", array[i]);
   }
}
```

1	200
2	1
3	0
4	2
5	204

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Problem 2 (Ultra Short Answer: 5 marks). Give your answers in the space provided only.

1. In the space given, write down the output of the program given below.

```c
#include<stdio.h>
void recurse(int array[], int sz){
  if(sz == 1)
    return;
  for(int i = 1; i < sz; i++){
    array[i] = array[i] + array[i-1];
  }
}
void deepRecurse(int array[], int sz){
  for(int i = 0; i < sz; i++)
    recurse(array+i, sz-i);
}
int main() {
  int array[5];
  int sz = 5;
  for (int i = 0; i < sz; ++i)
  {
    array[i] = i;
  }
  for(int i = sz; i > 0; i--)
    deepRecurse(array+i, sz-i);
  for (int i = 0; i < sz; ++i)
  {
    printf("%d\n", array[i]);
  }
}
```

1	0
2	1
3	3
4	11
5	47