Design and Analysis of Algorithms

Tutorial-1

1. What do you understand by Asymptotic notations. Define different Asymptotic notation with examples.

2. What should be time complexity of –

```
for(i=1 to n ){ i=i*2;}
```

3. T(n) = {3T(n-1) if n>0, otherwise 1}

4. T(n) = {2T(n-1)-1 if n>0, otherwise 1}

5. What should be time complexity of -

```
int i=1, s=1;
while(s<=n){
  i++; s=s+i;
  printf("#");
}
```

6. Time complexity of -

```
void function(int n){
   int i, count=0;
   for(i=1; i*i<=n; i++)
      count++
}
```

7. Time complexity of -

```
void function(int n){
   int i, j, k, count=0;
   for(i=n/2; i<=n; i++)
      for(j=1; j<=n; j=j*2)
         for(k=1; k<=n; k=k*2)
              count++
}
```

8. Time complexity of -

```
function(int n){
    if(n==1) return;
      for(i=1 to n){
          for(j=1 to n){
             printf("*");
          }
       }
    function(n-3);
}
```

9. Time complexity of -

```
void function(int n){
    for(i=1 to n){
      for(j=1; j<=n; j=j+i)
          printf("*")
    }
}
```

10. For the functions, n^k and c^n, what is the asymptotic relationship between these functions?

Assume that k >= 1 and c > 1 are constants. Find out the value of c and n0 for which relation holds.