Jaypee University of Engineering and Technology

18B11CI311 – Data Structures
B.Tech -3rd Semester
Tutorial – 2 (Time Complexity)

Q1. Analyze the time complexity for following code segments/ functions.

i.
```
1. int count = 0;
2. for (int i = n; i > 0; i /= 2)
3.       for (int j = 0; j < i; j++)
4.             count += 1;
```

ii.
```
for (i=1; i<=n; i++)
    for (j=1; j<=log(i); j++)
        PRINT "HELLO JUET !" ;
```

iii.
```
if (n==1)
    return;
for (int i=1; i<=n; i++)
{
    for (int j=1; j<=n; j++)
    {
        printf("*");
        break;
    }
}
```

iv.
```
void fun(int n, int arr[])
1. {
2.    int i = 0
3.    for(; i < n; i++)
4.       for(j=0;j < n && arr[i] < arr[j];j++)
5.          Print"i+j";
6. }
```

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

vi.
```
1. For I = 1 to n-1
2.       For J = 0 to (n-I-1)
3.             If a[J] > a[J+1] then,
4.                   Set temp = a[J]
5.                   Set a[J] = a[J+1]
6.                   Set a[J+1] = temp
```

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

viii.
```
1. For I = 0 to n-2
2.       min=I
3.       For J = I+1 to (n-1)
4.             If a[min] > a[J]
5.                   min=J
6.       Set temp = a[min]
7.       Set a[min] = a[I]
8.       Set a[I] = temp
```

Q2. Rank the following function by their order of growth (increasing order).

$(n+1)!$, 1 , $n^{1/\log n}$, $(3/2)^n$, $\log(\log n)$, $\mathrm{sqrt}(2)^{\log n}$, $(\log n)^{\log n}$, $\mathrm{sqrt}(\log n)$