**Quiz CSE 221**

**SET-A**

**Name:**

**Student ID:**

**Question 1 [3+3=6]**: True or False? Justify any Two your answers for

1. 2n2 +10000n= O(n3)
2. *n* = O(*n*2)
3. 2n+n2=O(2n)
4. n3 ≠ O(nlgn)

**Question 2 [5+5 = 10]**:Find out the Running Time for the following Code Segments.

Express it in Big-Oh Notation.

Order them in AsymptoticOrder

(i) sum2 = 0; [using formula: a+ar+ar2+… arn-1= a(rn-1)/(r-1)]

for (k=1; k<=n; k\*=2)

for (j=1;j<=k; j++)

sum2++;

Ans: O(n)

(ii) sum = 0

for(i = 0; i< n; i++)

{

for(j = 1; j <i \* i; j++)

{

for(k = 0; k <n+n; k++)

{

sum++;

}

}

}

Ans: O(n4)

(iii) sum2 = 0; [1+2+3+…+n=(n/2){2a+(n-1)d}]

for (k=1; k<=n; k\*=2)

for (j=1;j<=n; j++)

sum2++;

Ans: O(nlogn)

**Question 3 [5+2+3=10+2(Bonus)]**:

Apply Merge Sort for the following sequence of numbers. Divide the N-element sequence into **Three** Subsequences of **n/3** elements each.

Show the simulation of every step.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 10 | 3 | 12 | 5 | 7 | 0 | 4 | 2 | 6 |

Write down Recurrence Relation.

Draw the Recursion Tree.

Compute Total Cost.