

Subject: Design & Analysis of Algorithms

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Quiz – 1

10-03-2025 (5th Week)

30 minutes

Attempt questions.

Q1. Do the time analysis in the aspect of Theta (θ) of the below-given pseudocode.

```
1. for  $i \leftarrow 1$  to  $n$ 
2.   do
3.     for  $j \leftarrow 1$  to  $2i$ 
4.       do
5.          $k = j$ 
6.         while ( $k \geq 0$ )
7.           do
8.              $k = k - 1$ 
9.           end while
10.        end for
11.   end for
```

[4 Marks]

Q2. The Merge sort is a sorting technique based on the divide and conquer technique; the Merge sort divides the array into equal halves and then combines them in a sorted manner.

- Write a pseudocode of merge sort
- Write a recurrence relation of merge sort and expand terms up to the n size of an array, where $n = 8$.

[6 Marks]