B.Tech. (Computer Science and Engineering)
Semester-III
Subject: Data Structures And Algorithms
Subject code BCO 002B
Marks: 64

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CO1: Show the understanding of various data structure concepts like Stacks, Queues, Linked List, Trees and Files

Assignment#1

Tutorial sheet 1

Sec-A

1. [co1] Find the time complexity of the following code [2 marks]

```
for (int i = 1; i <= 5; i += 1)
{
print f("hello");
}
for (int i = 5; i > 0; i -= 1)
{
print f("ju");
}
```

2. [co1] What is space complexity? Why should we care about space complexity? [2 marks]
3. [Co1] Explain Lower Bound in shorting [2 marks]
4. [co1]How are the elements of a 2D array stored in the memory? Explain With example [2 marks]
5. [co1] Given the base address of an array B[1300.....1900] as 1020 and the size of each element is 2 bytes in the memory. Find the address of B[1700]. [2 marks]

Sec-B

1. [co1] Write an efficient program for printing K largest elements in an array. Elements in an array can be in any order [7 marks]
   Examples:
   Input: {1, 23, 12, 9, 30, 2, 50}, K = 3
   Output: 50, 30, 23
2. [co1] Explain the operation on data structure in detail [7 marks]
3. [Co1] What are Asymptotic Notations? Explain in detail [7 marks]

Sec-C

1. [co1] Implement quick sort algorithm on the below list : [11 marks]
   97,82,450,99,45,99,101,230,23 Write down all the implementation passes and the changed list, also let us know for what kind of input it will generate worst-case time complexity
2. [co1] Given an Integer N and a list arr. Sort the array using the bubble sort algorithm. [11 marks]
   Example 1:
   Input:
   N = 5
   arr[] = {4, 1, 3, 9, 7}
   Output: 1 3 4 7 9

3. [Co1] Write a linear search algorithm to Find the element in an array. Also analyze its behaviour in the worst, best and average cases. [11 marks]