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| **P.V.P Siddhartha Institute of Technology** |
| **Department of Computer Science and Engineering** |
| **Course: B. Tech** | **Year: II** | **Semester: I** | **Slip Test: I** | **A.Y:2022-23** |
| **Subject Code: 20ES1305** | **Subject Name: Data Structures** | **Regulation:PVP20** |
| **Duration: 50 min** | **Maximum Marks:10 Marks** | **Date:30/08/23** | **Session: F.N** |
| **Answer all the Questions. Each Question carries 5Marks 2×5M=10M** |

**SET-1**

1. What do you mean by space complexity and time complexity of an algorithm? Define recursive function. What are the essential conditions to be satisfied by a recursive function? [CO1,L2]

2. Compare the advantages and disadvantages of Bubble, Insertion and Selection sort using the following list of numbers [ 23, 56, 14, 34, 58, 97, 72 ]. [CO2,L3]

**SET-2**

 1. Solve the following recurrence relation for the Towers of Honai problem

T(N) = 0 , if N=0

 = 2 T(N-1) + 1 , if N>0

What are the disadvantages of recursive programming over iterative programming? [CO1,L2]

2. In the following case study: [CO2,L3]

In a library there are books that belong to many domains. If a person need to search for a book define different possible ways to find a book based on the arrangements.

**SET-3**

1. What do you mean by complexity of an algorithm? Explain the meaning of worst case analysis and best case analysis with an example. [CO1,L2]

2. Compare and contrast various techniques (at least two) through which Merge sort can be implemented. [CO2,L3]