Q.P.Code: 20MC9102 | R20 | H.T.No.

**SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR**
(AUTONOMOUS)
**MCA I Year I Semester Regular & Supplementary Examinations January/ February-2025**
**DATA STRUCTURES**

**Time: 3 Hours** **Max. Marks: 60**

(Answer all Five Units **5 x 12** = **60** Marks)

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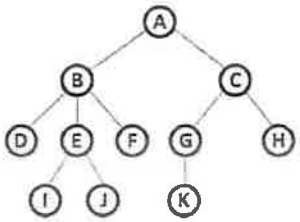
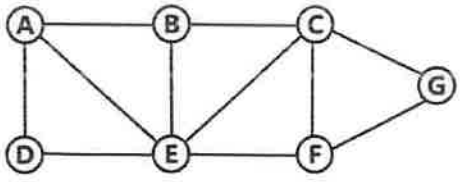
|---|---|---|---|---|---|
| | | **UNIT-I** | | | |
| 1 | a | What is a Data Structure? Explain its advantages. | CO1 | L1 | 6M |
| | b | Explain various types of Data Structures. | CO1 | L2 | 6M |
| | | **OR** | | | |
| 2 | a | Identify the steps to print the product of two numbers. | CO1 | L3 | 6M |
| | b | Identify the steps to display numbers from one to given number. | CO1 | L3 | 6M |
| | | **UNIT-II** | | | |
| 3 | a | What is linked list? What are the different types of linked list? | CO2 | L1 | 6M |
| | b | Prepare an algorithm to insert an element at the end of doubly linked list. | CO2 | L3 | 6M |
| | | **OR** | | | |
| 4 | a | Convert the expression (5 + 6) * (6 - 5) from infix to postfix | CO2 | L2 | 6M |
| | b | Evaluate the postfix expression 25*423-*+. | CO2 | L5 | 6M |
| | | **UNIT-III** | | | |
| 5 | a | Explain PostOrder Tree Traversal with an example. | CO3 | L1 | 6M |
| | b | Explain InOrder Tree Traversal with an example. | CO3 | L1 | 6M |
| | | **OR** | | | |
| 6 | | Identify the following terms from the given tree<br>i) Internal Nodes<br>ii) External Nodes<br>iii) Depth<br>iv) Height<br>v) Level<br>And find out the Preorder of the Tree.  | CO1 | L3 | 12M |
| | | **UNIT-IV** | | | |
| 7 | a | Prepare an algorithm for Quick sort with example. | CO2 | L3 | 6M |
| | b | Prepare an algorithm for Merge sort with example. | CO2 | L3 | 6M |
| | | **OR** | | | |
| 8 | a | Explain Binary Search with an algorithm and example. | CO4 | L2 | 6M |
| | b | Develop a program to demonstrate Binary Search. | CO4 | L6 | 6M |
| | | **UNIT-V** | | | |
| 9 | a | Discuss DFS Graph Traversal with an algorithm. | CO5 | L2 | 3M |
| | b | Explain DFS Graph traversal with steps for the following Graph. | CO5 | L2 | 9M |



**OR**

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|---|---|---|---|---|---|
| 10 | | Illustrate the steps for Dijkstra's algorithm with an example. | CO5 | L5 | 12M |

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