**18EC302**

**Hall Ticket Number:**

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| **II/IV B.Tech (Regular / Supplementary) DEGREE EXAMINATION** | | | |
| **February, 2021** | **Electronics & Communication Engineering** | | |
| **Third Semester** | **Data Structures using Python** | | |
| **Time:** Three Hours | | **Maximum:**50 Marks | |
| *Answer ALL Questions from PART-A.* | | | (10X1 = 10 Marks) |
| *Answer* ***ANY FOUR*** *questions from PART-B.* | | | (4X10=40 Marks) |
| **Part - A** | | | |

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| 1. | Answer all questions | | | (10X1=10 Marks) | | |
|  | a) | | Define Object. | | CLO-1 |  |
|  | b) | | List the types of operators used in python | | CLO-1 |  |
|  | c) | | Does Python Have a main() Method? | | CLO-1 |  |
|  | d) | | Define Doubly Linked list. | | CLO-2 |  |
|  | e) | | Give the node representation of SLL. | | CLO-2 |  |
|  | f) | | Mention ADT in stack. | | CLO-2 |  |
|  | g) | | Define Tree. | | CLO-3 |  |
|  | h) | | Construct Binary search tree for the elements: 20, 5, 30, 4, 45, 36, 21, 11, and 16. | | CLO-3 |  |
|  | i) | | What is meant by Undirected graph? | | CLO-4 |  |
|  | j) | | Define Spanning Tree. | | CLO-4 |  |
|  | | **Part - B** | | | | |
| 2. |  | | Explain operators in python with example programs. | | CLO-1 | 10M |
|  | |  | | | | |
| 3. | a)  b) | | Illustrate scope and namespaces of variables in python.  Explain referential arrays and compact arrays. | | CLO-1  CLO-1 | 5M  5M |
|  | |  | | | | |
| 4. | a)  b) | | Define queue. Explain how to implement queues using arrays.  Write a python program to implement queue using linked list. | | CLO-2  CLO-2 | 5M  5M |
|  | |  | | | | |
| 5. | a) | | Write a python program to perform the following operations on singly linked list   1. To insert an element to the empty list and at end of the list 2. To insert an element at beginning of linked list 3. To insert an element after particular location in linked list 4. To delete an existing mode from the linked list 5. To display the liked list | | CLO-2 | 10M |
|  | |  | | | | |
| 6. | a)  b) | | Define Binary tree. Explain Binary tree traversal techniques.  Write a python program to construct a binary tree & to traverse in a binary tree using in-order, pre-order, and post-order traversal techniques. | | CLO-3  CLO-3 | 5M  5M |
|  | |  | | | | |
| 7 | a)  b) | | Write the differences between the binary search tree & AVL tree and Construct AVL tree with the followings list of values 3,1,4,6,9,2 &5.  Discuss in detail about the rotations in an AVL tree using appropriate examples. | | CLO-3  CLO-3 | 5M  5M |
|  | |  | | | | |
| 8. | a)  b) | | What is graph? Explain the properties of a graph.  Explain following structures of graph  i. Adjacency Matrix structure ii. Adjacency list structure | | CLO-4  CLO-4 | 5M  5M |
|  | |  | | | | |
| 9. |  | | Illustrate how to traverse in graph using DFS and BFS techniques with any one example. | | CLO-4 | 10M |

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