



# MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AN AUTONOMOUS INSTITUTION)

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## II B.Tech I Sem Supplementary Examination, February-2022

### Data Structures

(CSE &amp; IT)

Time: 3 Hours.

Max. Marks: 70

Note: 1. Answer any FIVE questions.

2. Each question carries 14 marks and may have a, b as sub questions.

- |   |    |  |     |     |     |
|---|----|--|-----|-----|-----|
| 1 | a) | Consider a single linked list with n nodes where first node is pointed by a pointer called head. Develop a function which returns the position of the node when a node value is given.   | 7M  | C01 | BL3 |
|   | b) | Explain different applications of stack data structure.  | 7M  | C01 | BL2 |
| 2 |    | Explain the concept queue data structure and also explain both array implementation and pointer implementation of queue.   | 14M | C01 | BL2 |
| 3 | a) | Let us consider a simple hash function as " <i>key mod 11</i> " and sequence of keys as <i>50, 700, 76, 85, 92, 73, 101, 45, 62, 99</i> with table size <b>11</b> . Show how these keys will be stored, if we apply linear probing in case of collision. | 7M  | C02 | BL3 |
|   | b) | Explain the linear list implementation of dictionary.  | 7M  | C02 | BL2 |
| 4 |    | Define collision in hash table implementation. Explain different collision resolving techniques with an example.   | 14M | C02 | BL2 |
| 5 | a) | Define Binary search tree. Construct binary search tree with following keys : <i>55,45,65,40,60,70,66,99,2,34</i>  | 7M  | C03 | BL3 |
|   | b) | Explain the concept of AVL tree and discuss insert, search and delete operation in AVL Tree implementation.  | 7M  | C03 | BL2 |
| 6 |    | Explain about Red- black tree and in what way it is different from AVL Tree  | 14M | C03 | BL2 |
| 7 | a) | Explain the concept of heap sort with an example.  | 7M  | C04 | BL2 |
|   | b) | Explain different graph traversal techniques.  | 7M  | C04 | BL2 |
| 8 |    | Explain Knuth-Morris-Pratt algorithm in detail.  | 14M | C05 | BL2 |