

Time: 3 Hours

Max. Marks: 75

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A.
Part B consists of 5 Units. Answer any one full question from each unit.
Each question carries 10 marks and may have a, b, c as sub questions.

PART- A**(25 Marks)**

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|------|--|-----|
| 1.a) | What are the applications of Singly Linked Lists? | [2] |
| b) | Differentiate between linear and non linear data structures. | [3] |
| c) | What are the disadvantages of an array? | [2] |
| d) | Write the function of deletion of an element from the Queue. | [3] |
| e) | What is Threaded Binary Tree? | [2] |
| f) | What are the properties of Binary Tree? | [3] |
| g) | Which sorting algorithm is best if the list is already sorted. Why? | [2] |
| h) | What are the advantages of Binary Search? | [3] |
| i) | What is Trie? | [2] |
| j) | Explain how to calculate the Balanced factor in an AVL tree with an example? | [3] |

PART-B**(50 Marks)**

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|-----------|---|-------|
| 2.a) | Explain about the Asymptotic notations. | |
| b) | Write a program to find the size of the singly linked list. | [5+5] |
| OR | | |
| 3. | Explain the operations on circular linked lists with an example. | [10] |
| 4. | Write a program to convert infix expression to postfix expression using stack data structure. | [10] |
| OR | | |
| 5. | Write a program to implement the operations of Circular queue. | [10] |
| 6. | Explain about the Binary tree traversals with an example. | [10] |
| OR | | |
| 7. | How to represent a graph? Explain with an example. | [10] |
| 8. | Sort the following list of elements by using Selection sort and explain each step.
34, 45, 89, 12, 7, 4, 28, 100 | [10] |
| OR | | |
| 9. | Explain the different types of Hash functions with an example. | [10] |
| 10. | Consider the Text = AABAACAADAABAABA and Pattern = ABAA. Apply the KMP algorithm and Illustrate the intermediate steps. | [10] |
| OR | | |
| 11. | Insert the following list of elements into an initially empty red black tree
2, 1, 4, 5, 20, 9, 3, 15, 6, 7, 10, | [10] |