

(3 Hours)

[Total Marks: 80]

- N.B.: (1) Question No.1 is compulsory
 (2) Attempt any three from the remaining
 (3) Figures to the right indicate full marks
 (4) Assume suitable data if necessary

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| 1 | Solve any four: - | 20 |
| | (a) What is Data Structure? Define ADT with example. | |
| | (b) Explain Binary search with suitable examples. | |
| | (c) Explain in brief Double Ended Queue. | |
| | (d) Explain the types of Binary Tree. | |
| | (e) Discuss the polish notation of arithmetic expression in application of stacks. | |
| 2 | (a) Write a C program to implement a circular linked list. Provide the following operations: 1) Insert a node 2) Delete a node 3) Display the list | 10 |
| | (b) Convert the given infix expression to postfix expression using stack and the details of the stack at each step of conversion expression $a^b*c-d+e/f/(g+h)$ | 10 |
| 3 | (a) Explain Priority queue with its types and applications. | 10 |
| | (b) Write a program to perform various operations on stack using an array. | 10 |
| 4 | (a) Explain difference between Linear Queue and Circular Queue. | 10 |
| | (b) Write a program in C to implement a circular queue using an array. | 10 |
| 5 | (a) Construct the Huffman Tree and determine the code for each symbol in the sentence "DATASTRUCTURE." | 10 |
| | (b) Write a C program to implement singly linked list for following operations: 1) Insert a node at specific location 2) Delete a node from end 3) Display the list | 10 |
| 6 | (a) Explain DFS & BFS Traversal Techniques with example. | 10 |
| | (b) Using linear probing and quadratic probing insert the following values in a hash table of size 10. show how many collisions occur in each technique:

99, 33, 23, 44, 56, 43, 19. | 10 |