

D-12/2110

5574/NJ

CS-304/A-305-A

DATA STRUCTURE

Attempt any four questions. All questions carry equal marks

Time: 2 hrs

M.M.40

1. Write an algorithm for matching different parentheses like (, {, [in an algebraic expression. Support your answer using suitable example. (10)
2. a) Define time complexity and Big Oh(O) Notation. (5)
b) Explain classification of data structures in detail. (5)
3. Write the algorithm for Selection sort. Sort the following numbers using Selection sort.
23, 77,90,56,1,39,33,109 Show result after each pass. (10)
4. What is graph? What are its various types? With the help of example show sequential and linked representation of graph. Also discuss applications of graph. (10)
5. Explain following terminologies in context to tree (use suitable example) (10)
i) Root ii) Subtree iii) Sibling iv) Height of tree v) Path
6. a) What is a linked list? What are its various types? State its applications. (5)
b) Write the algorithm for deleting a node from the linked list. Give example to accompany your answer. (5)
7. a) Define Stack. Implement PUSH operation for stack using array with StackFull condition. (6)
b) Write postfix form of following expression using stack. (4)
i) $(a+b)*d+e/(f+a*d)*c$ ii) $((a/(b-c+d))*(e-a)*c)$
8. a) What is a queue? What are its various types? State its applications. (5)
b) Write an algorithm to implement queue using static array. (5)
9. Discuss array. What are its various types? Show its memory representation. Write algorithm for searching an element using linear search. (10)