

S.E. ° EACS NEP SEM III June 2026

Duration: 2 hrs

[Max Marks: 60]

11/06/26

- N.B. : (1) Question No 1 is Compulsory.
 (2) Attempt any three questions out of the remaining five.
 (3) All questions carry equal marks.
 (4) Assume suitable data, if required and state it clearly.

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| 1 | Attempt any THREE | [15] |
| a | Explain linear and non-linear data structures with examples. | [5] |
| b | Differentiate between Stack and Queue. | [5] |
| c | Explain the adjacency matrix with an example. | [5] |
| d | What is a Tree? List different types of trees. | [5] |
| 2 | a Convert the following infix expression to postfix and evaluate it:
A + B * C
(Show all intermediate steps using stack operations) | [8] |
| | b Design a Circular Queue using an array. Write algorithms for insertion and deletion. Analyze its drawbacks. | [7] |
| 3 | a Write an algorithm to delete a node from a singly linked list. | [8] |
| | b Explain Binary Search with an example and its advantages. | [7] |
| 4 | a Insert the following elements using linear probing in a hash table of size 10:
21, 31, 41, 51, 61, 71. Show collisions. | [8] |
| | b Explain tree traversal techniques with an example. | [7] |
| 5 | a Construct a Binary Search Tree using:
55, 30, 70, 20, 40, 60, 80, 65, 85
Then perform deletion of node 80 and show the updated tree. | [8] |
| | b Differentiate between BFS and DFS. Explain scenarios where one is preferred over the other. | [7] |
| 6 | a Explain Prim's algorithm to find Minimum Spanning Tree with an example. | [8] |
| | b Write an algorithm for Quick Sort. Analyze best, average, and worst-case complexities. | [7] |
