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SUBJECT CODE NO: - BNP-2692
FACULTY OF SCIENCE AND TECHNOLOGY
B.Sc. (NEP) (P-2024) S.Y Sem III
Examination November / December 2025
Computer Science (Data Structure)

[Time: 1 Hours]**[Max. Marks: 30]**

Please check whether you have got the right question paper.

N. B

- 1) Question No. 1 is compulsory
- 2) Attempt any four questions from Q 2 to Q7

SECTION A**Q.1 Multiple Choice Questions****10**

1. What is a data structure?
 - a) A programming language
 - b) A collection of algorithms
 - c) A way to store and organize data
 - d) A type of computer hardware
2. Which of the following operations is most expensive in a static array?
 - a) Accessing an element
 - b) Updating an element
 - c) Inserting an element at the beginning
 - d) Traversing the array
3. What is the main advantage of a linked list over an array?
 - a) Faster access time
 - b) Dynamic memory allocation
 - c) Easier sorting
 - d) Fixed size
4. In a circular linked list, the last node points to:
 - a) NULL
 - b) The head node
 - c) The previous node
 - d) Itself
5. What is the primary characteristic of a stack?
 - a) First In First Out (FIFO)
 - b) Last In First Out (LIFO)
 - c) Random Access
 - d) Circular Access
6. Which of the following operations is not typically associated with a stack?
 - a) Push
 - b) Pop
 - c) Peek
 - d) Sort
7. What happens when you try to dequeue from an empty queue?
 - a) The queue returns 0
 - b) An underflow condition occurs
 - c) The queue resizes automatically
 - d) The queue returns the last element

8. Which traversal method visits nodes in the order: left subtree, root, right subtree?

- a) Inorder
- b) Preorder
- c) Postorder
- d) Level-order

9. Which of the following searching algorithms is most efficient for a sorted array?

- a) Linear Search
- b) Binary Search
- c) Depth-First Search
- d) Breadth-First Search

10. What is the worst-case time complexity of Bubble Sort?

- a) $O(n)$
- b) $O(\log n)$
- c) $O(n \log n)$
- d) $O(n^2)$

SECTION B

Solve any four from the following:

- Q.2 Explain the 3 possibilities for insertion operation in an array. 5
- Q.3 Explain Singly Linked List with a proper diagram. 5
- Q.4 Explain the process of implementing Binary Search. 5
- Q.5 Explain any 5 scenarios where Stack can be used. 5
- Q.6 Explain Circular Queue with a proper diagram. 5
- Q.7 What is Inorder traversal. Write the Inorder traversal for the following tree 5

