

Total No. of Pages: 02
Total No. of Questions: 07

B. C. A. (Sem.-3rd)
DATA STRUCTURE
Subject Code: BSBC-302
Paper ID: [B0229]

Time: 3 Hrs.**Max. Marks: 60**

INSTRUCTIONS TO CANDIDATE:

1. Section-A is compulsory.
2. Section-B Attempt any four questions.

SECTION-A

O. I.

- Define problem analysis?
- What is use of Big O notations?
- Write an algorithm to insert an element in a linked list
- Define time space trade off
- List various uses of tree data structure
- What is need of doubly linked list?
- List various applications of queue data structure
- Define an array? How it is represented in memory?
- Discuss how an array is different from linked list
- What is dynamic storage management? Discuss its need



Section-B

- Q. 2. What is data structure? Discuss different types of data structures with their characteristics features. (10)
- Q. 3. Write notes on the following - (10)
- (a) Recursion
- (b) Priority queue and its uses

- Q. 4.** What is bubble sort? Write and explain an algorithm for bubble sort. Sort the following list of numbers using bubble sort (10)
- 144, 331, 76, 12, 52, 115, 35, 6, 1, 98, 62
- Q. 5.** What is binary search? What are its advantages over linear search? Write and explain an algorithm for searching an element using binary search (10)
- Q. 6.** Define tree and binary tree. Explain preorder and postorder tree traversal algorithm by taking suitable examples (10)
- Q. 7.** Define stack. How it is different from queue. Write an algorithm to implement stack using linked list (10)

END

Roll No. _____

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BCA (Sem. 3)
DATA STRUCTURES
Subject Code: BSBC-302
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Time: 3 Hrs.

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INSTRUCTIONS TO CANDIDATES:

1. Section A is **COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
2. Section B contains **SIX** questions carrying **TEN** marks each and students have to attempt any **FOUR** questions.

SECTION A

1. What is computational complexity of an algorithm?
 - a) Explain the enqueue operation on a queue?
 - b) Explain the time space tradeoff between array and linked list?
 - c) Write down the 2 basic operations to sort a list of numbers?
 - d) Write down limitations of the array data structure?
 - e) How is a stack different from a queue?
 - f) What is tree traversal?
 - g) Which data structure is most suited for bubble sort and why?
 - h) Draw the structure of node of a doubly linked list?
 - i) Define Insertion sort?
 - j) What are the front and rear pointers of a queue?



SECTION B

2. What is a stack? What operations can be performed on a stack? Write down the steps to perform these operations?
3. Write algorithm to generate a Fibonacci sequence
 - a) Using recursion,
 - b) Without using recursion?
4. Why is the reverse polish notation preferred to solve an expression? Write down the steps to convert an expression in infix notation into reverse polish notation?
5. What is dynamic storage management? How is it implemented?
6. Define a binary tree? How is it represented in memory?
7. Write down the algorithm to sort a list using selection sort? Discuss its complexity?