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Roll No. Total No. of Pages :02

Total No. of Questions: 09

B.Tech.(3D Animation & Graphics) (2012 Onwards)

B.Tech.(CSE)/(IT) (2011 Onwards)

(Sem.-3)

# **DATA STRUCTURES**

Subject Code: BTCS-304 Paper ID: [A1126]

Time: 3 Hrs. Max. Marks: 60

#### **INSTRUCTIONS TO CANDIDATES:**

- 1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
- 2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
- 3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

## **SECTION-A**

### 1. Write briefly:

- (a) State the need of data structures.
- (b) What are the advantages of Linked List over arrays?
- (c) What is big 'O' notation?
- (d) What is the difference between Linear and non-linear data structure?
- (e) List the applications of Stack and Queue.
- (f) Explain why binary search cannot be performed on a linked list.
- (g) What is threaded binary tree?
- (h) What is hashing?
- (i) What is breadth-first traversal?
- (j) Write **any two** applications of graph.

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### **SECTION-B**

- 2. Explain how stack is applied for evaluating an arithmetic expression.
- 3. Write an algorithm to insert an element at the specific position in an array.
- 4. Write an algorithm to find minimum and maximum element from a binary search tree.
- 5. How queues are represented in memory? Write their applications.
- 6. Write an algorithm for Binary search. What are its limitations?

## **SECTION-C**

- 7. a) Write an algorithm to insert new node at the end of a Doubly Linked List.
  - b) Convert the given Infix expression to Postfix expression using Stack and show the details of Stack at each step of conversion.

Expression : 
$$(a - b \land c * d) * (e - f / g)$$
.

- 8. What are the tree traversal techniques? Explain each with an example.
- 9. Write short note on
  - a) Quick sort
  - b) AVL Trees

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