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**

INSTRUCTION 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 has to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students has to attempt any TWO questions.**

SECTION A

1. Write briefly :

(a) Describe Big 'O' notation used in algorithms.

(b) Give the classification of data types.

(c) Differentiate between linear and non-linear data structure.

(d) Explain the terms Front and Rear for queue.

(e) State the principle of stack and give it’s two applications.

(f) Explain why binary search cannot be performed on a linked list.

(g) State different ways of traversing binary tree.

(h) What is hash function? Write its significance.

(i) Describe complete binary tree.

(j) Write any two applications of graph.

SECTION B

2. What are Linear and Non linear data structures? Give one example of each.

3. Write an algorithm for deleting a specific element from an array.

4. Explain application of Stack in recursive functions with example.

5. Explain the concept of circular queue and priority Queue with suitable example.

6. Discuss Heap sort with suitable example.

SECTION C

7. a) Write an algorithm to insert new node at the middle of a Singly 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 * c^ d) * (e + f / g).

   Note **:** ^ indicates exponent operator.

8. Discuss in brief the AVL tree and B-tree. What are its advantages?

9. Write short note on :

   a) Transversal of a graph

   b) Bubble sort