

Total No. of Questions: 09

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

B.Tech. (CSE)/(IT) (2011 Onwards) (Sem. – 3)

DATA STRUCTURES

M Code: 56594

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:

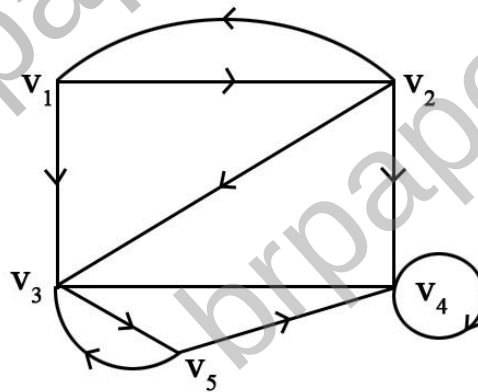
- a) What are the applications of Queue?
- b) How Trees are represented in memory?
- c) Define circular Queue.
- d) What are B trees?
- e) What do you mean by depth of tree?
- f) What is the linked representation of stacks?
- g) Define header nodes.
- h) Write the drawbacks of DQUEUES.
- i) What are the applications of heaps?
- j) What is the complexity of insertion sort?

SECTION B

2. Write an algorithm to implement Merge sort.
3. Make a binary search tree by considering the following eight numbers:
50, 24, 38, 24, 67, 40, 60, 52.
4. Write an Algorithm to traverse a graph using Depth First Search.
5. Explain Radix sort.
6. Build a heap H from the following list of numbers:
40, 65, 15, 48, 14, 50, 17, 22.

SECTION C

7. Write an algorithm to implement Quick sort. Write the steps to sort the following elements by quick sort method:
17, 28, 6, 87, 46.
8. a) Suppose a binary tree T is in memory. Write a procedure to delete all the terminal nodes.
b) Write an algorithm to insert a new node in linked list.
9. a) Consider the directed Graph G.



- i) Find indegree and outdegree of each node.
 - ii) Find number of simple paths.
 - iii) Is there any source or sink?
- b) Are B trees of order 2 are full binary trees? If yes, explain how.