R13

B.Tech II Year I Semester (R13) Regular Examinations December 2014
DATA STRUCTURES
(Computer Science and Engineering)

Time: 3 hours   Max. Marks: 70

PART – A
(Compulsory Question)
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1   Answer the following: (10 X 02 = 20 Marks)
   (a)   Define data structure. Mention any two applications of data structures.
   (b)   What is a double linked list? Name the three fields of double linked list.
   (c)   What is the best case and worst case time complexity of bubble sort and insertion sort?
   (d)   List the steps in pre-order traversal.
   (e)   Define adjacent nodes.
   (f)   What is a dictionary?
   (g)   List the applications of priority queues.
   (h)   Define Max heap.
   (i)   What is a splay tree?
   (j)   Mention the purpose of B-Trees.

PART – B
(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

2   (a)   Explain system life cycle with a neat diagram.
    (b)   Write an algorithm to perform the following operations on a single linked list.
          (i) Insert new node at the beginning of list. (ii) Count the number of nodes.
OR
3   Explain how queues can be implemented using arrays.

UNIT – II

4   State and explain the algorithm to perform Heap sort. Also analyze the time complexity of the algorithm.
OR
5   Define binary search tree. Explain the various operations with an example.

UNIT – III

6   (a)   How to pass array elements as arguments to function? Explain with one example.
    (b)   Write a C program to read names, marks of a class and calculate the total marks, average and percentage.
OR
7   What is meant by sorting? Write the algorithm for Selection sort and illustrate with an example.

UNIT – IV

8   Explain the path and adjacency multi-list representations of a graph with example.
OR
9   (a)   Differentiate between static and dynamic hashing.
    (b)   With an example, explain how skip list can be represented.

UNIT – V

10   Explain Red-Black trees in detail.

OR
11   Explain the operations on B$^+$ - tree with examples.
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