R15

Code: 15A05201

B.Tech II Year II Semester (R15) Regular Examinations May/June 2017
DATA STRUCTURES
(Electronics and Communication 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)   Write an algorithm to delete an element from an array.
   (b)   Draw the node structure of a double linked list. Explain the various fields present in it.
   (c)   Define hashing. Give example.
   (d)   List the types of dequeue.
   (e)   In what way a binary search tree differs from a tree? Give example.
   (f)   Define balancing factor. Give example.
   (g)   Write the worst, average and best case time complexities for shell and quick sorts.
   (h)   Distinguish between min and max heaps.
   (i)   How can we say that linear search is least efficient search technique? Explain.
   (j)   Assume that the given key is 1234. By using mid-square method, find the address required to store it by using 3 digit address.

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

UNIT – I

2   (a)   What is a sparse matrix? What are its drawbacks? Explain lower triangular sparse matrix with suitable example.
   (b)   What are different positions that a node can be inserted into a single linked list? Explain them in detail.
OR
3   (a)   List the advantages of double linked list over single linked list. What are the possible positions that a node can be deleted from a double linked list? Explain.
   (b)   Why we need to use arrays? Write the procedure to insert an element into an array.

UNIT – II

4   (a)   What is a stack? List the applications of stacks. Explain any two applications with suitable example.
   (b)   In how many ways a queue can be stored in memory? Explain them.
OR
5   (a)   List and explain the applications of queues.
   (b)   How can we insert and delete an element from a circular queue? Explain.

UNIT – III

6   Define binary search tree. Create a binary search tree from {7, 4, 12, 2, 6, 9, 19, 8, 15, 11, 3, 20, 5}. How can we delete an element from the binary search tree? After creation of the tree delete elements 6, 12 and 3. Explain the procedure in detail.
OR
7   How can we make an unbalanced tree as a balanced one? Explain various rotations that are involved in it. Give examples for each rotation.

UNIT – IV

8   (a)   Sort the following set of elements by using insertion sort {S, T, R, U, C, T, U, R, E, S}.
   (b)   Distinguish between list and binary insertion sort.
OR
9   (a)   With the help of algorithm and example, explain the sorting of elements by using quick sort.
   (b)   Give brief description about the process of merging the unordered files.

UNIT – V

10   (a)   Distinguish between binary and linear searching techniques.
   (b)   With the help of suitable example, explain the linked list collision resolution technique.
OR
11   (a)   What is meant by hashing? Why we need it? Explain hashing techniques.
   (b)   Write short notes on bucket hashing.