Code No: A109210502 **R09** **Set No. 2**

II B.Tech I Semester Examinations,MAY 2011
DATA STRUCTURES THROUGH C++
Common to Information Technology, Computer Science And Engineering, Electronics And Communication Engineering, Electrical And Electronics Engineering

Time: 3 hours **Max Marks: 75**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Explain about best, worst and average case complexities.
   (b) Write an algorithm for linear search on unsorted list of elements. [7+8]
2. (a) Construct the binary search tree for the following data.
   56, 32, 11, 75, 29, 85, 46, 88, 22, 5, 38, 14, 72, 9, 66.
   (b) What are the applications of binary search trees? [15]
3. What is a function? Explain various types of functions with examples? [15]
4. What is generic function? Can a generic function be overloaded? Explain. [15]
5. (a) Write Brute force pattern matching algorithm and also analyze its complexity.
   (b) What are the applications of tries? [15]
6. (a) Write about the separate chain hash searching operation.
   (b) Write about the open addressing. [10+5]
7. Write an algorithm to search an element from the B-tree and analyze its complexity by frequency count method. [15]
8. A file comprising 500,00 records is to be sorted. The internal memory has a capacity to hold only 50,000 records. Trace the steps of a balanced K - way merge for
   (a) k = 2 and
   (b) k = 4

   when
   (a) the file is available on a tape
   (b) the file is available on a disk

   Assume the availability of any number of tapes and a scratch disk for undertaking the appropriate sorting process. [15]

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Code No: A109210502 **R09** **Set No. 4**

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Time: 3 hours **Max Marks: 75**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Describe about the suffix trie with an example.
   (b) Follow the brute force algorithm and count the total number of comparisons done for the following.
   Text : babcbabbbcabcabcbbabcabcaacabc
   Pattern : abcabca. [15]
2. (a) Show that the depth first search can be used to find the connected components of an undirected graph.
   (b) Explain the properties of B tree. [15]
3. What is balanced search tree? Describe in detail about balanced search trees. [15]
4. (a) Explain the principle behind the external sorting.
   (b) Given a file of 50,000 records with an internal memory capacity of 10,000 records, trace the steps of a balanced P - way merge sort for T = 6 tapes (T_1, T_2, T_3, T_4, T_5, T_6). [15]
5. Write about the hash functions in detail. [15]
6. Discuss about various types of templates with examples. [15]
7. Write a C++ program to implement operations on doubly ended queue. [15]
8. Write about functions that have same name as that of class in C++ . What is the purpose of those functions. Explain with an example. [15]

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Code No: A109210502 **R09** **Set No. 1**

II B.Tech I Semester Examinations,MAY 2011
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Time: 3 hours **Max Marks: 75**

Answer any FIVE Questions
All Questions carry equal marks

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1. Explain different types of access specifiers with examples. [15]
2. Explain the working of DFS algorithm with an example. [15]
3. (a) What are the advantages of polyphase merge sort over balanced k way merge sort?
   (b) Let us suppose a source file was initially sorted to generate 34 runs of size 1 (1^{34}). Trace polyphase merge on 3 tapes (T_1, T_2, T_3) undertaking a 2 - way merge during each phase. [15]
4. (a) Draw the flowchart for Brute - force pattern matching.
   (b) Consider a Text T = raman likes mango to match against the pattern P = mango by using the Knuth - Morries - Pratt pattern algorithm. [15]
5. (a) Explain the syntax of the overloading prefix form of unary (++) operator with an example.
   (b) Write a program for operator overloading unary (–) operator. [7+8]
6. Write about the linked representation of binary trees. [15]
7. Explain the deletion operation of BST with an example. [15]
8. (a) Write algorithms for the skip list search, insert and delete operations
   (b) Explain skip list representation with example. [10+5]

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Code No: A109210502 **R09** **Set No. 3**

II B.Tech I Semester Examinations,MAY 2011
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Time: 3 hours **Max Marks: 75**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Sort the following lists in ascending order using heap sort
   D, A, T, A, S, T, R, U, C, T, U, R, E
   (b) What are the applications of priority queue? [15]
2. (a) What are the advantages and disadvantages of tries?
   (b) Construct a trie for the binary keys 011, 111, 101, 001. [15]
3. What are search trees? Explain the different types of search trees and its applications. [15]
4. Explain the array implementation of a stack and illustrate with example. [15]
5. (a) Differentiate constructor and destructor with examples?
   (b) Illustrate parameterized constructors with example? [7+8]
6. (a) What is operator over loading? Explain with an example.
   (b) Write a program to add two objects and store result in another object. [7+8]
7. Explain about insertion using linear probing and its algorithm. [15]
8. Write a C++ program to delete an element from the B- tree. [15]

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