Code No: R05210503 **Set No. 1**

II B.Tech I Semester Supplimentary Examinations, November 2008
ADVANCED DATA STRUCTURE
(Common to Computer Science & Engineering and Electronics & Computer Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Can you think of a situation where your program would crash without reaching the breakpoint which you set at the beginning of main()?
   (b) When are copy constructors called?
   (c) Can a copy constructor accept an object of the same class as parameter, instead of reference of the object? [5+5+6]
2. What is template? Explain about function templates and class templates with suitable examples. [16]
3. (a) What are some ways try / catch / throw can improve software quality?
   (b) How can we handle a constructor that fails?
   (c) How can we handle a destructor that fails. [5+5+6]
4. (a) Define a sparse matrix? Explain its representation? Write the program that gives the header for the class sparse Matrix which uses row major mapping of a sparse matrix into an arrayList.
   (b) Write the methods **get (theRow, the Column)** and **set (theRow, theColumn, theValue)** for a sparse matrix. [10+6]
5. (a) What is Linear Probing? Write a C++ program that gives the data members and constructors for the hash table class that uses linear probing.
   (b) Write the C++ program that gives the method search of a hash table. [8+8]
6. Define a Red-Black tree? Write the procedures to perform insertion, deletion in a Red-Black tree? [16]
7. (a) Describe deletion operation of a B-tree with an example.
   (b) Prove that the height of a red black tree storing n items is O(logn). [8+8]
8. (a) Describe about search engine and inverted files.
   (b) Explain the main features of Boyer-Moore algorithm. [10+6]

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Code No: R05210503 **Set No. 2**

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ADVANCED DATA STRUCTURE
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Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) What do you mean by Data abstraction?
   (b) Difference between "C structure" and "C++ structure".
   (c) Diffrence between a "assignment operator" and a "copy constructor".
   (d) What is the difference between 'overloading' and "overridding"? [4+4+4+4]
2. What is template? Explain about function templates and class templates with suitable examples. [16]
3. (a) Explain about the formatted I/O in C++.
   (b) Explain about the console I/O in C++. [8+8]
4. Define the Abstract data type for Stack. Write a C ++ program to implement stack ADT using linked list. [16]
5. (a) What is a dictionary? Define the abstract data type for it? Write the abstract class for the dictionary?
   (b) Give the applications of dictionary or dictionary with duplicates in which sequential access is desired. [8+8]
6. Define a class called **binarySearchTree** to represent a Binary search tree. Extend this class by adding a public method **outputInRange (Low,High)** that outputs, in ascending order of key, all elements in a binary search tree whose key lies between Low and High. Use recursion and avoid entering sub trees that cannot possibly contain any elements with keys in desired range. [16]
7. (a) Describe deletion operation of a B-tree with an example.
   (b) Prove that the height of a red black tree storing n items is O(logn). [8+8]
8. (a) Explain the boyar Moore algorithm with an example.
   (b) What are the advantages and disadvantages of tries with respect to binary search tree. [10+6]

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Code No: R05210503 **Set No. 3**

II B.Tech I Semester Supplimentary Examinations, November 2008
ADVANCED DATA STRUCTURE
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Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) What is a friend function? Explain the advantages and disadvantages of it?
   (b) What is static member function? Explain it's limitations. [8+8]
2. (a) What is Hybrid inheritance? Write a program to illustrate the concept of Hybrid Inheritance.
   (b) What is single inheritance? Write a program to illustrate the concept of single Inheritance. [8+8]
3. (a) Explain about try, catch, throw keywords in C++?
   (b) Write a program to illustrate the exception handling mechanism in C++. [8+8]
4. What is a linked list / chain.. Write the program which gives the constructor and destructor for *chain*. [16]
5. Develop a class for hash table using linear probing and neverUsed concept to handle an erase operation. Write complete C++ code for all the methods. Include a method to reorganize the table when (say) 60% of the empty buckets have never used equal to false. The reorganization should move pairs around as necessary and leave a properly configured hash table in which neverUsed is true for every empty bucket. [16]
6. (a) What is a Binary search tree? Define a C++ abstract class that corresponds to this ADT.
   (b) Write a method to search for an element of a Binary Search Tree? What is its time complexity? [8+8]
7. (a) Write deletion algorithm of red black tree.
   (b) Describe the operations of Splay tree. [8+8]
8. Give the fail indexes used by the KMP algorithm for the following patterns.
   (a) AAAB
   (b) AABAACAABABA
   (c) ABRACADABRA
   (d) ASTRACASTRA. [16]

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Code No: R05210503 **Set No. 4**

II B.Tech I Semester Supplimentary Examinations, November 2008
ADVANCED DATA STRUCTURE
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Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) What do you mean by Stack unwinding?
   (b) What is the difference between const char ∗myPointer and char ∗const my pointer?
   (c) Define precondition and post-condition to a member function.
   (d) What are the conditions that have to be met for a condition to be an invariant of the class? [4+4+4+4]
2. What is template? Explain about function templates and class templates with suitable examples. [16]
3. Create a program that opens a file (the first argument on the command line) and searches it for any one of a set of words (the remaining arguments on the command line). Read the input a line at a time, and print out the lines (with line numbers) that match. [16]
4. (a) Write the program which gives the Destructor for list/chain.
   (b) Write a method to return the index of the first occurrence of an element in a list/chain. [8+8]
5. (a) What is a dictionary? Define the abstract data type for it? Write the abstract class for the dictionary?
   (b) Give the applications of dictionary or dictionary with duplicates in which sequential access is desired. [8+8]
6. (a) Explain about the LLr, LRr, LLb, LRb imbalances in a Red-Black tree with example?
   (b) Draw the sequence of rotations required to perform a single right rotation and a double LR rotation in an AVL tree? [8+8]
7. (a) Write pseudo code procedure for insert operations in a red-black tree.
   (b) Write an algorithm for visualization of a key insertion algorithm in a B-tree. [8+8]
8. (a) Write an algorithm for deleting a string from a compressed trie and also analyze its complexity.
   (b) Describe the characteristics of Boyer-Moore algorithm. [10+6]

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