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Code No: X0523 **R07** SET - 1

II B. Tech I Semester, Supplementary Examinations, Nov – 2012
ADVANCED DATA STRUCTURES
(Com. to CSE, ECC)

Time: 3 hours Max. Marks: 80

Answer any **FIVE** Questions
All Questions carry **Equal** Marks
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1. a) How does a main() function in C++ differ from main() in C? Describe the major parts of a C++ program.
   b) What is a friend function? Give its merits and demerits.

2. a) What is an operator function? Describe the syntax and usage of an operator function with examples.
   b) Write a program that illustrates of applications of base and derived classes.

3. a) What is an abstract data type? Are basic data types are abstract data types?
   b) Explain various components of space complexity?

4. a) What is a hash function? Briefly describe any two methods of collision resolution
   b) What is linear probing? Briefly describe quadratic probing

5. a) Write a C++ function to build a heap? How many number of comparisons required for it?
   b) Show the result of inserting 10, 12, 1, 14, 6, 5, 8, 15, 3 and 9, one at a time into an initially empty heap?

6. Define a Binary Search Tree? Write the procedures to perform insertion, deletion and searching in a binary search tree?

7. a) With an example, find the number of disk accesses needed to delete an element that is in a non leaf mode of a B-Tree of order m?
   b) With an example, Briefly describe the process of insertion into B-tree

8. Write an algorithm for Brute Force pattern matching and analyze its time complexity with suitable example.

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Code No: X0523 **R07** SET - 2

II B. Tech I Semester, Supplementary Examinations, Nov – 2012
ADVANCED DATA STRUCTURES
(Com. to CSE, ECC)

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 dynamic initialization of a variable? Give an example.
   b) With an example, briefly describe dynamic memory allocation and deallocation

2. a) A friend function can not be used to overload the assignment operator =. Explain why?
   b) Write a main program that calls a deeply nested function containing an exception. Incorporate necessary exception handling mechanism.

3. a) What is template? Explain about function templates and class templates with suitable examples.
   b) Define Algorithm? What are the characteristics of algorithms?

4. a) Write a method in C++ to erase a pair in the dictionary with key theKey in a skip list representation. What is the complexity of this method?
   b) What are the data members of skipList class? Write the constructor for skipList.

5. a) Write a C++ function to insert an element into min heap.
   b) With an example, briefly describe multiway merge

6. What is an AVL Tree? Explain about the different insertion, deletion and searching operations in AVL trees.

7. a) What is the maximum number of disk accesses needed to delete an element that is in a non leaf node of a B-tree of order m.
   b) Briefly describe Red-black and splay trees.

8. a) What are the advantages and disadvantages of tries with respect to binary search tree.
   b) Explain the complexity of Brute Force pattern matching algorithm.

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Code No: X0523 **R07** SET - 3

II B. Tech I Semester, Supplementary Examinations, Nov – 2012
ADVANCED DATA STRUCTURES
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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) Can a copy constructor accept an object of the same class as parameter, instead of reference of the object?
   b) When will you make a function inline? Why?
   c) What are the advantage of using new operator as compared to the function malloc()?

2. a) What are the different forms of inheritance? Give an example of each.
   b) Briefly describe function over loading with an example

3. a) Write a C++ program to build a stack with its basic operations.
   b) With an example, briefly describe Queue ADT.

4. a) What is the structure to represent node in a skip list. Write the constructor for skipList.
   b) What are the major advantages of extendible hashing over other hashing techniques?

5. a) What are priority queues? Explain its advantages and disadvantages over queues.
   b) Write the C++ program that gives the method search of a hash table.

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.

7. a) Write a program for inserting an element in B-trees.
   b) Briefly compare search trees

8. a) Explain the compressed trie with an example.
   b) Write an algorithm for Brute Force pattern matching and analyze its time complexity with suitable example.

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Code No: X0523 **R07** SET - 4

II B. Tech I Semester, Supplementary Examinations, Nov – 2012
ADVANCED DATA STRUCTURES
(Com. to CSE, ECC)

Time: 3 hours Max. Marks: 80

Answer any **FIVE** Questions
All Questions carry **Equal** Marks
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1. a) What is a class? With an example, briefly describe access control.
   b) How function overloading can be achieved? On what basis, the compiler distinguishes between a set of overloaded functions having the same name?

2. a) Describe the syntaxes of single and multiple inheritances. When do we use multiple inheritance?
   b) When do we make a virtual function "pure"? What are the implications of making a function a pure virtual function?

3. a) With an example, briefly describe list ADT.
   b) Briefly discuss the components of space complexity

4. a) Explain about the skip list representation of dictionary with an example?
   b) Define Dictionary and Dictionary with duplicates? List the operations performed on a dictionary?

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 a C++ function to remove max element form a heap.

6. a) Explain how to represent binary search tree with duplicates?
   b) Explain the insertion operation of binary search tree with duplicates?

7. a) Draw the order-7 B-tree resulting from inserting the following keys into an initially empty tree T: 4,40,23,50,11,34,62,78,66,22,90,59,25,72,64,77,39,12
   b) Describe the B-trees? Explain the advantages of B-trees.

8. How will the KMP algorithms behave if the pattern and/or the text are null (have length zero)? Will they"crash"? if not, will their output be meaningful and correct.

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