

Code No: X0523

R07

SET - 1

II B. Tech I Semester Supplementary Examinations May – 2013

ADVANCED DATA STRUCTURES

(Com. to CSE, ECC)

Time: 3 hours

Max. Marks: 80

Answer any **FIVE** Questions
All Questions carry **Equal** Marks

1. a) Discuss about classes and objects in detail and illustrate this with a simple program.
b) Explain in detail about constructors and destructors with an example. (8M+8M)
2. a) Discuss briefly about function overloading with a program.
b) What are the types of inheritance? Discuss with an example. (8M+8M)
3. a) Give two reasons why analysts are interested in time complexity of a program?
b) Discuss about the List ADT in detail with an example. (8M+8M)
4. a) What is hash function? Briefly describe collision resolution.
b) Discuss briefly about dictionaries and quadratic probing. (8M+8M)
5. a) Define priority queue? Discuss briefly about the Heap representation of priority queue.
b) Discuss briefly about the procedure of multi-way merge with an example. (8M+8M)
6. a) Construct an AVL tree and a binary search tree from the following numbers.
69, 80, 73, 40, 33, 70, 1, 86, 90.
b) Discuss briefly about the procedure of insertion in binary search trees. (8M+8M)
7. a) Define Red-Black trees? Explain the procedure of insertion in B-Tree with an example?
b) Write a program for deleting an element from B-Trees? Explain about the procedure of deletion. (8M+8M)
8. a) What is pattern matching? Briefly describe compressed Tries.
b) Explain in detail about standard tries with example? (8M+8M)

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Answer any **FIVE** Questions
All Questions carry **Equal** Marks

1. a) Explain the procedure of defining inline functions within a class.
b) Write a program to understand the usage and effect of a static data member. (8M+8M)
2. a) Discuss about operator overloading in detail.
b) Explain in detail about base class and derived class with an example. (8M+8M)
3. a) Discuss briefly about the components of space complexity.
b) Illustrate about Stack ADT with an example. (8M+8M)
4. a) Apply the mid of square method to get the hash index of table size 97 for following keys-
1123, 1234, 1012, 1034, 1103, 1005
b) Discuss briefly about the extendible hashing technique with an example. (8M+8M)
5. a) What is external sorting? Briefly describe polyphase merge.
b) Discuss briefly about the procedure of multiway merge with a program? (8M+8M)
6. a) Construct a binary search tree from these numbers-
90, 36, 58, 96, 32, 92, 12, 93, 24, 97, 38, 60, 98. Delete nodes 12, 60, 36, 96 from the tree.
b) What is an AVL Tree? Discuss briefly about the height of an AVL tree. (8M+8M)
7. a) Define B-Trees? Explain the procedure of searching in B-Trees with an example.
b) Briefly compare B-Trees and AVL Tree. (8M+8M)
8. a) Discuss briefly about Brute-Force pattern matching algorithm.
b) Explain in detail about compressed tries with an example? (8M+8M)

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SET - 3

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Answer any **FIVE** Questions
All Questions carry **Equal** Marks

1. a) Write a program to illustrate when constructors and destructors are executed?
b) Discuss briefly about this pointer and demonstrate this pointer with an example? (8M+8M)
2. a) What is an inheritance? Write a program to illustrate the concept of Hybrid Inheritance.
b) How do you define a copy constructor or assignment operator for a class that contains a pointer to a (abstract) base class? (8M+8M)
3. a) Discuss briefly about components of time complexity? Order the following functions by growth rate: N , $2N$, $N^{1.5}$, N^2 , $N \log N$, 2^N , N^3 ?
b) Discuss briefly about the queue ADT with an example? (8M+8M)
4. a) Apply the folding method to get the hash index of table size 79 for following keys- 56497, 79256, 27143, 49239, 18942, 77722.
b) What is collision resolution? Explain in detail about open hashing and closed hashing. (8M+8M)
5. a) Discuss briefly about the operations in priority queue?
b) Discuss briefly about the procedure of sorting using multiway merge sort? (8M+8M)
6. a) Explain how to represent BST with duplicates
b) Briefly describe Red-black and splay trees (8M+8M)
7. a) Write a program for inserting an element in B-Trees? Explain the procedure of insertion?
b) Discuss briefly about the concept of splay trees? (8M+8M)
8. a) Discuss briefly about Boyer-Moore pattern matching algorithm?
b) Explain in detail about suffix tries? (8M+8M)

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SET - 4

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Time: 3 hours

Max. Marks: 80

Answer any **FIVE** Questions
All Questions carry **Equal** Marks

1. a) Explain briefly about dynamic memory allocation and de-allocation?
b) What are friend functions? Explain with an example briefly? (8M+8M)
2. a) Discuss briefly about the runtime polymorphism using virtual functions?
b) Explain in detail about the base class access control? (8M+8M)
3. a) Write the non recursive algorithm for finding the Fibonacci sequence and derive its time complexity.
b) What is template? Explain about function templates and class templates with suitable examples. (8M+8M)
4. a) Apply the division method to get the hash index of table size 23 for following keys- 68738, 22567, 38624, 63289, 81346
b) Explain in detail about the insertion deletion procedures in the skip list representation? (8M+8M)
5. a) What is a heap? Briefly describe the properties of a heap.
b) Discuss briefly about the procedure of sorting using multiway merge. (8M+8M)
6. a) Write a program of binary search tree and display all left nodes of tree?
b) Discuss briefly about the procedure of deletion in an AVL trees? (8M+8M)
7. a) Discuss briefly about the procedure of deletion in B-trees by taking an example.
b) Discuss briefly about B-Tree of order m with an example? (8M+8M)
8. a) Discuss briefly about Knuth-Morris-Pratt pattern matching algorithm?
b) Distinguish between Standard, compressed and suffix tries? (8M+8M)