

II B.Tech I Semester Regular Examinations, November 2007
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

1. (a) What are the differences between a C++ struct and C++ class?
(b) What is the difference between compiling and linking?
(c) In a large program what problems might occur from putting c++ code in headers?
(d) What is an “inline” function and when would you use it? [4+4+4+4]
2. (a) Explain the need for “Virtual Destructor”.
(b) Can we have “Virtual Constructors”? [8+8]
3. What is the difference between the C++ standard library, and the C++ standard template library? [16]
4. (a) What is a Sparse Matrix? Explain about the linear list representation of a sparse matrix?
(b) Write a C++ program to implement multiplication of two sparse matrices represented using an array linear list? [8+8]
5. (a) Explain the linear probing method in Hashing? Explain its performance analysis?
(b) What is hashing with Chains? Explain? Compare this with Linear Probing? [8+8]
6. (a) What is an AVL search tree? How do we define the height of it? Explain about the *balance factor* associated with a node of an AVL tree.
(b) Explain how an AVL tree can be used to sort a sequence of n elements in O (n log n) time. [8+8]
7. (a) Prove that let T be a B-tree of order m and height h. Let $d = \lceil m/2 \rceil$ and let n be the number of elements in T.
i. $2d^{h-1} - 1 \leq n \leq m^n - 1$
ii. $\log_m(n+1) \leq h \leq \log_d\left(\frac{n+1}{2}\right) + 1$
(b) Explain the advantages of splay tree in representation of dictionaries. [10+6]
8. (a) Describe about search engine and inverted files.
(b) Explain the main features of Boyer-Moore algorithm. [10+6]
