Punjab Technical University
Master of Computer Application Examination

MCA 2nd Semester DATA STRUCTURE USING C++ 2006

Time: Three hours maximum: 100 marks

PART A Answer all questions (8x5=40 marks)

1. (a) Explain the basics of C++ languages. Or
   (b) what are abstract data types? Give example.

2. (a) Discuss the array as an Abstract Data types in detail. Or
   (b) Discuss the string as an Abstract Data type in detail.

3. (a). Discuss about templates in C++. Or
   (b). Explain in detail about inheritance.

4. (a). What are singly linked lists? Describe how to represent them in C++. Or
   (b) what are virtual functions? Give examples.

5. (a). What are circular lists? Give examples. Or
   (b). Give a brief account on linked stacks and queues.

6. (a). Discuss in detail about static hashing. Or
   (b). Give a detailed description about Binomial Heaps.

7. (a) What is a AVL Trees? Give examples. Or
   (b) Discuss in detail about optimal binary search trees.

8. (a) What are B trees? Give examples. Or
   (b). Describe the features of Heap structures

PART B Answer ALL questions (5*12=60 marks)

9. (a) Explain the following: I) Data Abstraction and encapsulation II) system life cycle.

10. (a) What are doubly linked lists? Describe how to represent them in C++. Or
    (b). Describe the following: I) A reusable linked list class. II) Dynamic binding in C++.

11. (a). What are binary trees? Explain the various binary tree traversals with examples. Or
    (b). Give a detailed description on threaded Binary Trees.

12. (a). Discuss in detail about optimal Binary search trees. Or
    (b). Write notes on the Following: I) AVL Trees. II) B-Trees.

13. (a) Discuss the various features of Hashing. Or
    (b). Give a detailed account on Heap Structure.