淡江大學九十二學年度碩士班招生考試試題

系別：資訊管理學系　　　　科目：資　料　結　構

准考項目請打「○」否則打「×」
簡單型計算機
X

本試題共　1　頁

Notice : Please make your answers as clear as possible

1. Give an efficient algorithm to determine if there exists an integer i such that $a_i = i$ in an array of n integers $a_1 < a_2 < a_3 < \ldots < a_n$. Analyze the time complexity of your algorithm. (20%)

2. A max heap contains 15 nodes and each node has a different key value. How many different configurations are there for the max heap ? Explain how you obtain the answer. (20%)

3. Give the algorithm for converting an infix expression, *expr*, into its prefix equivalent. (20%)

4. In static hashing, linear probing is used to solve the problem of overflow. Please discuss the situation and problems caused when the deletion of entries from a hash table occurs and how you handle it. (20%)

5. Ten numbers are inserted into an initially empty binary search tree (BST) in the following order : 50, 40, 60, 80, 90, 56, 52, 54, 53, 70.
   (1) draw the final BST (20%)
   (2) draw the BST after deletion of 52 from the BST in (1)
   (3) draw the BST after deletion of 60 from the BST in (2)