

佛光人文社會學院九十四學年度碩士班招生考試試題卷

系所別：資訊學系碩士班

科目：資料結構

用紙第 1 頁共 1 頁

- What are passing by value and passing by reference? Give an example to show their differences. (10%)
- What are the advantages and the disadvantages of using array and using linked list? (10%)
- Suppose an array is declared as $A[4..5][2..4][1..2][3..4]$, and $A[4][2][1][3]$ is stored at position 0.
 - How many elements in the array A ? (2%)
 - Using row major order, what is the position for $A[5][4][2][4]$? (3%)
 - Using column major order, what is the position for $A[5][4][2][4]$? (3%)
- Convert the following expressions into postfix and prefix notations.
 - $A/B - C + D * E - A * C$ (4%)
 - $A * (B + C) / D - G$ (4%)
 - $A * B / C$ (4%)
- Describe the preorder, inorder, and postorder algorithms for traversing a binary tree. And write results with these algorithms for the following binary tree. (12%)
- Suppose a binary tree with n nodes and depth k ;
 - What is the maximum number of nodes on level i of the binary tree? (3%)
 - What is the maximum number of nodes of the binary tree? (3%)
 - What is a full binary tree? (3%)
- Suppose an original max heap as follow, draw the results for the following operations.
 - insert a node with value 15; (3%)
 - insert a node with value 60; (3%)
 - delete a node from the heap. (3%)
- Construct a binary search tree with the following inserting order (10%)
60, 78, 90, 66, 34, 12, 15, 45, 10, 85.
- Give an example to illustrate the difference between stack and queue. (10%)
- Construct the minimum cost spanning tree for the following graph. State your algorithm and each stage in detail. (10%)

