東吳大學　九十四 學年度碩士班研究生招生考試試題

系級	資訊科學系碩士在職專班	考試時間	100 分鐘
科目	計算機概論	本科總分	100 分

1. (a) (5%) Convert the prefix expression –+B/*ACD/EF into postfix.
   (b) (5%) If A=3, B=2, C=5, D=2, E=8 and F=6, calculate the postfix expression ABCDE++**EF–*.

2. (a) (10%) Write a recursive function (in Pascal or C) to find the minimal number in an array of numbers.
   (b) (10%) What is the return value f(8) of the following function?

```
int f(int n)
{
    if (n==0 || n==1)
        retrun (1);
    else
        retrun (f(n-1)+2*f(n-2));
}
```

3. (10%) Please use the Floyd's algorithm to find the shortest path length matrix for the following adjacency matrix $W = \begin{bmatrix} 0 & \infty & 3 & \infty \\ 2 & 0 & \infty & \infty \\ \infty & 7 & 0 & 1 \\ 6 & \infty & \infty & 0 \end{bmatrix}$.

4. (a) (5%)Construct the binary search tree for the sequence of 40, 35, 60, 20, 50, 70, 10, 25, and 27.
   (b)(5%) Then, show the binary tree after 35 is deleted from it.

5. Convert the following numbers.
   (a) $D2F_{16}$ into base 8. (3%)
   (b) 001111_2 into base 16. (3%)
   (c) 23.625_{10} into base 2. (4%)

6. (10%) Please use Huffman code to code the following text ABACABAD. Show Huffman coding tree and the codeword table.

背面尚有試題

東吳大學　九十四 學年度碩士班研究生招生考試試題

系級	資訊科學系碩士在職專班	考試時間	100	分鐘
科目	計算機概論	本科總分	100	分

7. (10%) Is it possible to write a sorting algorithm for sorting an array with N numbers such that the time-complexity of the algorithm is $O(N)$ in the best case. (Justify your answer to get credit)

8. (10%) Please construct a code for the characters A, B, C, and D using bit patterns of length six so that the Hamming distance between any two patterns is at least four.

9. (10%) Suppose we want to exchange the values stored in memory cells 2 and 3. What is wrong with the following sequence of steps? how to correct those steps?

   Step 1. Move the contents of cell number 2 to cell number 3.

   Step 2. Move the contents of cell number 3 to cell number 2.